



1/47

SEQUENCE LISTING

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Kern, Gunther
Lundquist, Rolf T.
Newton, David Trevor
Xue, Yafeng

<120> CRYSTAL STRUCTURE OF GLUTAMATE RACEMASE
(MURI)

<130> ASZD-P01-007

<140> US 10/729,571

<141> 2003-12-05

<150> US 60/435,167

<151> 2002-12-20

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| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | |
| 1 | | | 5 | | | | | | 10 | | | | | 15 | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| aaa | agc | ctt | tta | aaa | gcg | cga | ttg | ttt | gat | gaa | atc | atc | tac | tat | ggc | 96 |
| Lys | Ser | Leu | Leu | Lys | Ala | Arg | Leu | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | |
| | | 20 | | | | | 25 | | | | | | 30 | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gat | agc | gct | aga | gtg | cct | tat | ggc | act | aaa | gac | ccc | acc | acg | atc | aag | 144 |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| caa | ttt | ggc | tta | gag | gct | ttg | gat | ttt | ttc | aaa | ccg | cat | gag | att | gaa | 192 |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Glu | Ile | Glu | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| tta | ttg | att | gtg | gca | tgc | aac | acc | gcg | agc | gct | ctg | gct | tta | gaa | gag | 240 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

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Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
 65                      70                      75                      80

atg caa aag tat tct aaa atc cct att gtg ggc gtg att gag cca agc 288
Met Gln Lys Tyr Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
                      85                      90                      95

att tta gcg atc aag cgg caa gtg gaa gat aaa aac gcc cct att tta 336
Ile Leu Ala Ile Lys Arg Gln Val Glu Asp Lys Asn Ala Pro Ile Leu
                      100                      105                      110

gtg cta ggg aca aaa gcg acg att caa tcc aac gcc tat gac aac gcc 384
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
                      115                      120                      125

ctg aaa caa caa ggc tat ttg aac att tcg cat tta gct act tct ctt 432
Leu Lys Gln Gln Gly Tyr Leu Asn Ile Ser His Leu Ala Thr Ser Leu
                      130                      135                      140

ttt gtg cct ttg att gaa gaa agt att tta gag ggc gaa ttg tta gaa 480
Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
145                      150                      155                      160

act tgc atg cat tat tat ttc act ccc tta gag att tta ccc gaa gtg 528
Thr Cys Met His Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
                      165                      170                      175

atc att tta ggt tgc acg cat ttt ccc tta atc gct caa aaa att gag 576
Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
                      180                      185                      190

ggc tat ttc atg ggg cat ttt gcc ctt cca acg ccc ccc cta ctc atc 624
Gly Tyr Phe Met Gly His Phe Ala Leu Pro Thr Pro Pro Leu Leu Ile
                      195                      200                      205

cat tcg ggc gat gct att gta gaa tat ttg caa caa aaa tac gcc ctt 672
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
                      210                      215                      220

aaa aac aat gca tgc aca ttc cct aaa gtg gaa ttt cat gcg agc ggc 720
Lys Asn Asn Ala Cys Thr Phe Pro Lys Val Glu Phe His Ala Ser Gly
225                      230                      235                      240

gat gtg atc tgg cta gaa aga caa gct aaa gaa tgg ctc aaa ttg taa 768
Asp Val Ile Trp Leu Glu Arg Gln Ala Lys Glu Trp Leu Lys Leu *
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                20                25                30

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| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Glu | Ile | Glu |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Met | Gln | Lys | Tyr | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ile | Leu | Ala | Ile | Lys | Arg | Gln | Val | Glu | Asp | Lys | Asn | Ala | Pro | Ile | Leu |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Asn | Ile | Ser | His | Leu | Ala | Thr | Ser | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Ser | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Thr | Cys | Met | His | Tyr | Tyr | Phe | Thr | Pro | Leu | Glu | Ile | Leu | Pro | Glu | Val |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Ile | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | Gln | Lys | Ile | Glu |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Gly | Tyr | Phe | Met | Gly | His | Phe | Ala | Leu | Pro | Thr | Pro | Pro | Leu | Leu | Ile |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Lys | Asn | Asn | Ala | Cys | Thr | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Asp | Val | Ile | Trp | Leu | Glu | Arg | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | |
| | | | | 245 | | | | | 250 | | | | | 255 | |

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<210> 3
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<213> H. pylori
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<221> CDS
<222> (1) ... (768)
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| <400> 3 | | | | | | | | | | | | | | | | |
| atg | aaa | ata | ggc | gtt | ttt | gat | agc | ggg | gtg | ggg | ggg | ttt | agc | gtt | tta | 48 |
| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| | | | | | | | | | | | | | | | | |
| aaa | agc | ctt | tta | aaa | gcg | caa | ttg | ttt | gat | gaa | atc | atc | tat | tat | ggc | 96 |
| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Leu | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| | | | | | | | | | | | | | | | | |
| gat | agc | gct | aga | gtg | cct | tat | ggc | act | aaa | gac | ccc | act | acg | atc | aag | 144 |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |
| | | | | | | | | | | | | | | | | |
| caa | ttt | ggc | tta | gag | gct | ttg | gat | ttt | ttc | aaa | cca | cac | cag | att | gaa | 192 |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Gln | Ile | Glu | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |
| | | | | | | | | | | | | | | | | |
| tta | ttg | att | gtg | gca | tgc | aac | acc | gca | agc | gct | ctg | gct | tta | gaa | gag | 240 |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | | |

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atg caa aag cat tcc aaa atc cct att gtg ggc gtg att gag cca agc 288
Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
                        85                      90                      95

att tta gcg atc aag caa caa gtg aaa gat aaa aac gcc cct att tta 336
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
                        100                      105                      110

gtg cta ggg aca aaa gcg acg att caa tcc aac gct tat gac aac gcc 384
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
                        115                      120                      125

ctg aaa caa caa ggc tat ttg aat gtt tcg cat tta gcc act tct ctt 432
Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
                        130                      135                      140

ttt gtg cct ttg att gaa gaa agt att tta gag ggc gaa ttg tta gag 480
Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
                        145                      150                      155                      160

act tgc atg cgt tat tat ttc act ccc tta aag att tta cct gaa gtg 528
Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
                        165                      170                      175

att att tta ggt tgc acg cat ttt ccc ttg att gct caa aaa att gag 576
Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
                        180                      185                      190

ggc tat ttc atg gag cat ttt gcc ctt cca acg ccc ccc cta ctc atc 624
Gly Tyr Phe Met Glu His Phe Ala Leu Pro Thr Pro Pro Leu Leu Ile
                        195                      200                      205

cat tcg ggc gat gct att gta gaa tat ttg cag caa aaa tac gcc ctt 672
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
                        210                      215                      220

aaa aac aat gca cac gca ttc cct aaa gtg gaa ttt cat gcg agc ggc 720
Lys Asn Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
                        225                      230                      235                      240

gat gtg atc tgg cta gaa aga caa gct aaa gaa tgg ctc aaa ttg taa 768
Asp Val Ile Trp Leu Glu Arg Gln Ala Lys Glu Trp Leu Lys Leu *
                        245                      250                      255

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<210> 4
<211> 255
<212> PRT
<213> H. pylori

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Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
 1      5      10      15
Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
 20      25      30
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
 35      40      45

```

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Gln | Ile | Glu |
| 50 | | | | | | 55 | | | | | 60 | | | | |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ile | Leu | Ala | Ile | Lys | Gln | Gln | Val | Lys | Asp | Lys | Asn | Ala | Pro | Ile | Leu |
| | | | | 100 | | | | 105 | | | | | 110 | | |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Asn | Val | Ser | His | Leu | Ala | Thr | Ser | Leu |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Ser | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Lys | Ile | Leu | Pro | Glu | Val |
| | | | | 165 | | | | 170 | | | | | | 175 | |
| Ile | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | Gln | Lys | Ile | Glu |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Pro | Thr | Pro | Pro | Leu | Leu | Ile |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Lys | Asn | Asn | Ala | His | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Asp | Val | Ile | Trp | Leu | Glu | Arg | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | |
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<212> DNA
<213> H. pylori
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<220>
<221> CDS
<222> (1) . . . (768)
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| <400> | | | | | | | | | | | | | | | | 5 | |
| atg | aaa | ata | ggc | gtt | ttt | gat | agc | ggg | gtg | gga | ggg | ttt | agc | gtt | tta | 48 | |
| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | | |
| 1 | | | | 5 | | | | 10 | | | | 15 | | | | | |
| | | | | | | | | | | | | | | | | | |
| aaa | agc | ctt | tta | aaa | gcg | caa | tta | ttt | gat | gaa | atc | atc | tat | tat | ggc | 96 | |
| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Leu | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | | |
| | | | 20 | | | | 25 | | | | 30 | | | | | | |
| | | | | | | | | | | | | | | | | | |
| gat | agc | gct | aga | gtg | cct | tat | ggc | act | aaa | gac | ccc | act | acg | atc | aag | 144 | |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | | |
| | | | 35 | | | | 40 | | | | 45 | | | | | | |
| | | | | | | | | | | | | | | | | | |
| caa | ttt | ggc | tta | gag | gct | ttg | gat | ttt | ttc | aaa | ccg | cac | cag | att | gaa | 192 | |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Gln | Ile | Glu | | |
| | | | 50 | | | | 55 | | | | 60 | | | | | | |
| | | | | | | | | | | | | | | | | | |
| tta | ttg | att | gtg | gca | tgc | aac | aca | gcg | agc | gct | cta | gct | tta | gaa | gag | 240 | |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | | |
| | | | 65 | | | | 70 | | | | 75 | | | | 80 | | |
| | | | | | | | | | | | | | | | | | |
| atg | caa | aaq | cat | tcc | aaa | atc | cct | att | gtg | ggc | gtg | att | gag | cca | agc | 288 | |

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| att | tta | gcg | atc | aag | cga | caa | gta | aaa | gat | aaa | aac | gcc | cct | att | tta | 336 | |
| Ile | Leu | Ala | Ile | Lys | Arg | Gln | Val | Lys | Asp | Lys | Asn | Ala | Pro | Ile | Leu | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| gtg | cta | ggg | aca | aaa | gcg | acg | atc | caa | tcc | aac | gct | tat | gac | aat | gcc | 384 | |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| ctg | aaa | caa | caa | ggc | tat | ttg | aat | gtt | tcg | cat | tta | gcc | act | tct | ctt | 432 | |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Asn | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| ttt | gtg | cct | ttg | att | gaa | gaa | agt | att | tta | gag | ggc | gaa | ttg | tta | gaa | 480 | |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Ser | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | |
| act | tgc | atg | cgt | tat | tat | ttc | act | ccc | tta | aag | att | tta | ccc | gaa | gtg | 528 | |
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Lys | Ile | Leu | Pro | Glu | Val | | |
| | | | | 165 | | | | | 170 | | | | | 175 | | | |
| att | att | tta | ggt | tgc | acg | cat | ttt | ccc | tta | atc | gct | caa | aaa | att | gag | 576 | |
| Ile | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | Gln | Lys | Ile | Glu | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| ggc | tat | ttt | atg | gag | cat | ttt | gcc | ctt | tca | aca | ccc | ccc | cta | ctc | atc | 624 | |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Ser | Thr | Pro | Pro | Leu | Leu | Ile | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| cat | tcg | ggc | gat | gct | att | gta | gga | tat | ttg | cag | caa | aaa | tac | gcc | ctt | 672 | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Gly | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu | | |
| | | 210 | | | | 215 | | | | | 220 | | | | | | |
| aaa | aaa | aat | gca | cac | gca | ttc | cct | aaa | gtg | gaa | ttt | cat | gcg | agc | ggc | 720 | |
| Lys | Lys | Asn | Ala | His | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly | | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | | |
| gat | gtg | atc | tgg | cta | gaa | aaa | caa | gct | aaa | gaa | tgg | ctc | aaa | ttg | taa | 768 | |
| Asp | Val | Ile | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | * | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | |

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 <212> PRT
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 20 25 30
 Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
 35 40 45
 Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Glu
 50 55 60

Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
 65 70 75 80
 Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
 85 90 95
 Ile Leu Ala Ile Lys Arg Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
 100 105 110
 Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
 115 120 125
 Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
 130 135 140
 Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
 145 150 155 160
 Thr Cys Met Arg Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
 165 170 175
 Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
 180 185 190
 Gly Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
 195 200 205
 His Ser Gly Asp Ala Ile Val Gly Tyr Leu Gln Gln Lys Tyr Ala Leu
 210 215 220
 Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
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 245 250 255

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<220>
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 Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
 1 5 10 15
 aaa agc ctt tta aaa gcg caa ttg ttt gat gaa atc atc tat tat ggc 96
 Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
 20 25 30
 gat agc gct aga gtg cct tat ggc act aaa gac ccc acc acg atc aag 144
 Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
 35 40 45
 caa ttt ggc tta gag gct ttg gat ttt ttc aaa ccg cac cag att aaa 192
 Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
 50 55 60
 tta ttg att gtg gca tgc aac aca gcg agc gct cta gct tta gaa gag 240
 Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
 65 70 75 80
 atg caa aag cat tcc aaa atc cct att gtg ggc gtg att gag cca agc 288
 Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
 85 90 95

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att tta gcg atc aag caa caa gta aaa gat aaa aac gcc cct att tta 336
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
100 105 110

gtg cta ggg aca aaa gcg acg atc caa tcc aac gct tat gac aac gcc 384
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115 120 125

ctg aaa caa caa ggc tat ttg aat gtt tcg cat tta gcc act tct ctt 432
Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
130 135 140

ttt gtg cct ttg att gaa gaa agt att tta ggg ggc gaa ttg tta gaa 480
Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Gly Gly Glu Leu Leu Glu
145 150 155 160

act tgc atg cgt tat tat ttc act ccc tta aag att tta cct gaa gtg 528
Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
165 170 175

att att tta ggt tgc acg cat ttt ccc ttg atc gct caa aaa att gag 576
Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190

ggc tat ttt atg gag cat ttt gcc ctt tca acg ccc ccc cta ctc atc 624
Gly Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
195 200 205

cat tcg ggc gat gct att gtg gaa tat ttg cag caa aaa tac gcc ctt 672
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

aag aaa aat gca cac gca ttc cct aaa gtg gaa ttt cat gcg agc ggc 720
Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

gat gtg atc tgg cta gaa aaa cag gct aa 749
Asp Val Ile Trp Leu Glu Lys Gln Ala
245

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<210> 8
<211> 249
<212> PRT
<213> H. pylori

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<400> 8
Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1 5 10 15
Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
20 25 30
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
35 40 45
Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
50 55 60
Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65 70 75 80

```


Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85 90 95
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
100 105 110
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115 120 125
Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
130 135 140
Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Gly Gly Glu Leu Leu Glu
145 150 155 160
Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
165 170 175
Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190
Gly Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
195 200 205
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220
Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240
Asp Val Ile Trp Leu Glu Lys Gln Ala
245

<210> 9
<211> 768
<212> DNA
<213> H. pylori

<220>
<221> CDS
<222> (1)...(768)

<400> 9
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Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1 5 10 15
aaa agc ctt tta aaa gcg caa cta ttt gat gaa atc atc tat tat ggc 96
Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
20 25 30
gat agt gct aga gtg cct tat ggc act aaa gac ccc acc acg atc aag 144
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
35 40 45
caa ttt ggc tta gag gct ttg gat ttt ttc aaa ccg cac cag att gga 192
Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Gly
50 55 60
tta ttg att gtg gca tgc aac aca gcg agc gct cta gct tta gaa gag 240
Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65 70 75 80
atg caa aag cat tcc aaa atc cct att gtg ggc gtg att gaa cca agc 288
Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85 90 95
att tta gcg atc aag caa caa gta aaa gat aaa aac gcc tct att ttg 336

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Leu | Ala | Ile | Lys | Gln | Gln | Val | Lys | Asp | Lys | Asn | Ala | Ser | Ile | Leu | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| gtg | cta | ggg | aca | aaa | gcg | acg | atc | caa | tcc | aac | gct | tat | gac | aac | gcc | 384 |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | |
| | | 115 | | | | | 120 | | | | | 125 | | | | |
| ctg | aaa | caa | caa | ggc | tat | ttg | aat | gtt | tcg | cat | tta | gcc | act | tct | ctt | 432 |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Asn | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| ttt | gtg | cct | ttg | att | gaa | gaa | agt | att | tta | gag | ggc | gaa | ttg | cta | gaa | 480 |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Ser | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |
| act | tgc | atg | cgt | tat | tat | ttc | act | ccg | tta | gag | atc | ttg | cct | gaa | gtg | 528 |
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Glu | Ile | Leu | Pro | Glu | Val | |
| | | | 165 | | | | | 170 | | | | | | 175 | | |
| gtt | att | tta | ggc | tgc | acg | cat | ttt | ccc | tta | atc | gct | caa | aaa | att | gag | 576 |
| Val | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | Gln | Lys | Ile | Glu | |
| | | 180 | | | | | 185 | | | | | | 190 | | | |
| ggc | tat | ttt | atg | gag | cat | ttt | gcc | ctt | tca | acg | ccc | ccc | cta | ctc | atc | 624 |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Ser | Thr | Pro | Pro | Leu | Leu | Ile | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| cat | tcg | ggc | gat | gct | att | gtg | gaa | tat | ttg | cag | caa | aaa | tac | gcc | ctt | 672 |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| aaa | aaa | aat | gca | cac | gca | ttc | cct | aaa | gtg | gaa | ttt | cat | gcg | agt | ggc | 720 |
| Lys | Lys | Asn | Ala | His | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | |
| gat | gtg | atc | tgg | cta | gaa | aaa | cag | gct | aaa | gaa | tgg | ctc | aaa | ttg | taa | 768 |
| Asp | Val | Ile | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | * | |
| | | | 245 | | | | | | 250 | | | | | 255 | | |

<210> 10
 <211> 255
 <212> PRT
 <213> H. pylori

| | | | | | | | | | | | | | | | | |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| <400> 10 | | | | | | | | | | | | | | | | |
| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Leu | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | |
| | | 20 | | | | | | 25 | | | | | 30 | | | |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Gln | Ile | Gly | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | |
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |

```

Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Ser Ile Leu
      100      105      110
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
      115      120      125
Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
      130      135      140
Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
      145      150      155      160
Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
      165      170      175
Val Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
      180      185      190
Gly Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
      195      200      205
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
      210      215      220
Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
      225      230      235      240
Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu
      245      250      255

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<210> 11
 <211> 749
 <212> DNA
 <213> H. pylori

<220>
 <221> CDS
 <222> (1)...(747)

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<400> 11
atg aaa ata ggc gtt ttt gat agc ggt gtg gga ggg ttt agc gtt tta 48
Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
  1           5           10           15

aaa agc ctt tta aaa gcg caa att ttt gat gaa atc atc tat tat ggc 96
Lys Ser Leu Leu Lys Ala Gln Ile Phe Asp Glu Ile Ile Tyr Tyr Gly
      20           25           30

gat agc gct aga gtg cct tat ggc act aaa gac ccc acc acg atc aag 144
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
      35           40           45

caa ttt ggc tta gag gct ttg gat ttt ttc aaa ccg cac cag att aaa 192
Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
      50           55           60

tta ttg att gtg gca tgc aac aca gcg agc gct cta gct tta gaa gag 240
Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
      65           70           75           80

atg caa aag cat tcc aaa atc cct att gtg ggc gtg att gag cca agc 288
Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
      85           90           95

att tta gcg atc aag caa caa gta aaa gat aaa aac gcc cct att tta 336
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
      100           105           110

```

```

gtg cta ggg aca aaa gcg acg att caa tct aac gct tat gac aac gcc 384
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
      115                      120                      125

cta aaa caa caa ggc tat ttg aac att tcg cat tta gcc act tct ctt 432
Leu Lys Gln Gln Gly Tyr Leu Asn Ile Ser His Leu Ala Thr Ser Leu
      130                      135                      140

ttt gtg cct ttg att gaa gaa agt att tta gag ggc gaa ttg tta gag 480
Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
      145                      150                      155                      160

act tgc atg cgt tat tat ttc act ccc tta aag att tta cct gaa gtg 528
Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
      165                      170                      175

atc att tta ggt tgc acg cat ttt ccc ttg atc gct caa aaa att gag 576
Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
      180                      185                      190

ggc tat ttt atg gag cat ttt gcc ctt cca acc ccc ccc cta ctc atc 624
Gly Tyr Phe Met Glu His Phe Ala Leu Pro Thr Pro Pro Leu Leu Ile
      195                      200                      205

cat tcg ggc gat gct att gta gaa tat ttg cag caa aaa tac acc ctt 672
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Thr Leu
      210                      215                      220

aag aaa aat gca cac gca ttc cct aaa gtg gaa ttt cat gcg agt ggc 720
Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
      225                      230                      235                      240

gat gtg gtt tgg cta gaa aaa cag gct aa 749
Asp Val Val Trp Leu Glu Lys Gln Ala
      245

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```

<210> 12
<211> 249
<212> PRT
<213> H. pylori

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<400> 12
Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
 1      5      10      15
Lys Ser Leu Leu Lys Ala Gln Ile Phe Asp Glu Ile Ile Tyr Tyr Gly
      20      25      30
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
      35      40      45
Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
      50      55      60
Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
      65      70      75      80
Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
      85      90      95
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
      100      105      110

```

Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
 115 120 125
 Leu Lys Gln Gln Gly Tyr Leu Asn Ile Ser His Leu Ala Thr Ser Leu
 130 135 140
 Phe Val Pro Leu Ile Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
 145 150 155 160
 Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
 165 170 175
 Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
 180 185 190
 Gly Tyr Phe Met Glu His Phe Ala Leu Pro Thr Pro Pro Leu Leu Ile
 195 200 205
 His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Thr Leu
 210 215 220
 Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
 225 230 235 240
 Asp Val Val Trp Leu Glu Lys Gln Ala
 245

<210> 13
 <211> 768
 <212> DNA
 <213> H. pylori

<220>
 <221> CDS
 <222> (1)...(768)

<400> 13
 atg aaa ata ggc gtt ttt gat agc ggt gtg gga ggg ttt agc gtt tta 48
 Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
 1 5 10 15
 aaa agc ctt tta aaa gcg caa att ttt gat gaa atc atc tat tat ggc 96
 Lys Ser Leu Leu Lys Ala Gln Ile Phe Asp Glu Ile Ile Tyr Tyr Gly
 20 25 30
 gat agt gct aga gtg cct tat ggc act aaa gac ccc acc acg atc aag 144
 Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
 35 40 45
 caa ttt ggc tta gag gct ttg gat ttt ttc aaa ccg cac cag att gga 192
 Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Gly
 50 55 60
 tta ttg att gtg gca tgc aac aca gcg agc gct cta gct tta gaa gag 240
 Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
 65 70 75 80
 atg caa aag cat tcc aaa atc cct att gtg ggc gtg att gag cca agc 288
 Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
 85 90 95
 att tta gcg atc aaa caa caa gtg aaa gat aaa aac gct cct att tta 336
 Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
 100 105 110
 gtg cta ggg aca aaa gcg acg att caa tct aac gct tac gat aac gcc 384

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| ctg | aaa | caa | caa | ggc | tat | ttg | aat | ggt | tcg | cat | tta | gcc | act | tct | ctt | 432 | |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Asn | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| ttt | gtg | cct | ttg | att | gaa | gaa | aat | att | tta | gag | ggc | gaa | ttg | cta | gaa | 480 | |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Asn | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | |
| act | tgc | atg | cgt | tat | tat | ttc | act | ccc | tta | aag | att | tta | cct | gaa | gtg | 528 | |
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Lys | Ile | Leu | Pro | Glu | Val | | |
| | | | | 165 | | | | | 170 | | | | | 175 | | | |
| atc | att | tta | ggc | tgc | acg | cat | ttt | ccc | ttg | atc | gct | caa | aaa | att | gag | 576 | |
| Ile | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | Gln | Lys | Ile | Glu | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| ggc | tat | ttt | atg | gag | cat | ttt | gcc | ctt | tta | acg | ccc | ccc | cta | ctc | atc | 624 | |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Leu | Thr | Pro | Pro | Leu | Leu | Ile | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| cat | tct | ggc | gat | gct | att | gta | gaa | tat | ttg | caa | caa | aaa | tac | gcc | ctt | 672 | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu | | |
| | | 210 | | | | 215 | | | | | | 220 | | | | | |
| aag | aaa | aat | gca | cac | tca | ttc | cct | aaa | gtg | gaa | ttt | cat | gcg | agc | ggc | 720 | |
| Lys | Lys | Asn | Ala | His | Ser | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly | | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | | |
| gat | gtg | atc | tgg | cta | gaa | aaa | cag | gct | aaa | gaa | tgg | ctc | aaa | ttg | taa | 768 | |
| Asp | Val | Ile | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | * | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | |

<210> 14
 <211> 255
 <212> PRT
 <213> H. pylori

<400> 14

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Ile | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | | |
| | | 20 | | | | | | 25 | | | | | 30 | | | | |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Gln | Ile | Gly | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | | |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | | | |
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser | | |
| | | | | 85 | | | | | 90 | | | | | 95 | | | |
| Ile | Leu | Ala | Ile | Lys | Gln | Gln | Val | Lys | Asp | Lys | Asn | Ala | Pro | Ile | Leu | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | | |
| | | 115 | | | | | 120 | | | | | | 125 | | | | |

```

Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
 130          135          140
Phe Val Pro Leu Ile Glu Glu Asn Ile Leu Glu Gly Glu Leu Leu Glu
145          150          155          160
Thr Cys Met Arg Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
          165          170          175
Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
          180          185          190
Gly Tyr Phe Met Glu His Phe Ala Leu Leu Thr Pro Pro Leu Leu Ile
          195          200          205
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
          210          215          220
Lys Lys Asn Ala His Ser Phe Pro Lys Val Glu Phe His Ala Ser Gly
225          230          235          240
Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu
          245          250          255

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<210> 15
 <211> 768
 <212> DNA
 <213> H. pylori

<220>
 <221> CDS
 <222> (1)...(768)

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<400> 15
atg aaa ata ggc gtt ttt gat agc ggt gtg gga ggg ttt agc gtt tta 48
Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
 1          5          10          15

aaa agc ctt tta aaa gcg caa att ttt gat gaa atc atc tat tat ggc 96
Lys Ser Leu Leu Lys Ala Gln Ile Phe Asp Glu Ile Ile Tyr Tyr Gly
          20          25          30

gat agc gct aga gtg cct tat ggc act aaa gac ccc acc acg atc aag 144
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
          35          40          45

caa ttt ggc tta gag gct ttg gat ttt ttc aaa ccg cac cag att gaa 192
Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Glu
          50          55          60

tta ttg att gtg gca tgc aac aca gcg agc gct cta gct tta gaa gag 240
Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
          65          70          75          80

atg caa aag cat tcc aaa atc cct att gtg ggc gtg att gaa cca agc 288
Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
          85          90          95

att tta gcg atc aaa caa caa gtg aaa gat aaa aac gct cct att tta 336
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
          100          105          110

gtg cta ggg aca aaa gcg acg att caa tct aac gct tac gac aac gcc 384
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
          115          120          125

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ctg aaa caa caa ggc tat ttg aat gtt tcg cat tta gcc act tct ctt 432
Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
130 135 140

ttt gtg cct ttg att gaa gaa agt att tta gag ggc gaa ttg cta gaa 480
Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
145 150 155 160

act tgc atg cgt tat tat ttc act ccc tta aag att tta ccc aaa gta 528
Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Lys Val
165 170 175

atc att tta ggt tgc acg cat ttt ccc ttg atc gct cac caa att aag 576
Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala His Gln Ile Lys
180 185 190

ggc tat ttt atg ggg cat ttt gcc ctt tca acg ccc ccc cta ctc atc 624
Gly Tyr Phe Met Gly His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
195 200 205

cat tcg ggc gat gct att gtg gga tat ttg caa caa aaa tac gcc ctt 672
His Ser Gly Asp Ala Ile Val Gly Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

aag aaa aat gca cac gca ttc cct aaa gtg gaa ttt cat gcg agc ggc 720
Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

gat gtg atc tgg cta gaa aaa cag gct aaa gaa tgg ctc aaa ttg taa 768
Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu *
245 250 255

```

```

<210> 16
<211> 255
<212> PRT
<213> H. pylori

```

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<400> 16
Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1 5 10 15
Lys Ser Leu Leu Lys Ala Gln Ile Phe Asp Glu Ile Ile Tyr Tyr Gly
20 25 30
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Ile Lys
35 40 45
Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Glu
50 55 60
Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65 70 75 80
Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85 90 95
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
100 105 110
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115 120 125
Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
130 135 140

```


Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
 145 150 155 160
 Thr Cys Met Arg Tyr Phe Thr Pro Leu Lys Ile Leu Pro Lys Val
 165 170 175
 Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala His Gln Ile Lys
 180 185 190
 Gly Tyr Phe Met Gly His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
 195 200 205
 His Ser Gly Asp Ala Ile Val Gly Tyr Leu Gln Gln Lys Tyr Ala Leu
 210 215 220
 Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
 225 230 235 240
 Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu
 245 250 255

<210> 17
 <211> 768
 <212> DNA
 <213> H. pylori

<220>
 <221> CDS
 <222> (1)...(768)

<400> 17
 atg aaa ata ggc gtt ttt gat agc ggt gtg gga ggg ttt agc gtt tta 48
 Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
 1 5 10 15
 aaa agc ctt tta aaa gcg caa tta ttt gat gaa atc atc tat tat ggc 96
 Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
 20 25 30
 gat agc gct aga gtg cct tat ggc act aaa gac ccc acc acg atc aag 144
 Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
 35 40 45
 caa ttt ggc tta gag gct ttg gat ttt ttc aaa ccg cac cag att aaa 192
 Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
 50 55 60
 tta ttg att gtg gca tgc aac aca gcg agt gct ctg gct tta gaa gag 240
 Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
 65 70 75 80
 atg caa aag cat tcc aaa atc cct att gtg ggc gtg att gag cca agc 288
 Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
 85 90 95
 att tta gcg atc aaa caa cag gta aaa gat aaa aac gcc ccc att tta 336
 Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
 100 105 110
 gtg cta ggc aca aaa gcg acg att caa tct aac gct tac gat aac gct 384
 Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
 115 120 125
 ctg aaa cga caa ggc tat ttg aac gtt tcg cat tta gcc act tcc ctt 432

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Leu | Lys | Arg | Gln | Gly | Tyr | Leu | Asn | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | | |
| 130 | | | | | | 135 | | | | | 140 | | | | | | |
| ttt | gtg | cct | ttg | att | gaa | gaa | agt | att | tta | gag | ggc | gaa | ttg | tta | gaa | 480 | |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Ser | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | |
| act | tgc | atg | cgt | tat | tat | ttc | act | ccc | tta | aag | att | tta | cct | gaa | gtg | 528 | |
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Lys | Ile | Leu | Pro | Glu | Val | | |
| | | | | 165 | | | | | 170 | | | | | 175 | | | |
| atc | att | tta | ggt | tgt | acg | cat | ttt | ccc | ttg | atc | gct | caa | aaa | att | gag | 576 | |
| Ile | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | Gln | Lys | Ile | Glu | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| ggc | tat | ttt | atg | gaa | cat | ttt | gcc | ttt | cca | acg | ccc | ccc | cta | ctc | atc | 624 | |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Phe | Pro | Thr | Pro | Pro | Leu | Leu | Ile | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| cat | tgc | ggc | gat | gct | att | gtg | gaa | tat | ttg | cag | caa | aaa | tac | gcc | ctt | 672 | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu | | |
| | | 210 | | | | 215 | | | | | 220 | | | | | | |
| aag | aaa | aat | gca | cac | gca | tta | cct | aaa | gtg | gaa | ttt | cat | gcg | agc | ggc | 720 | |
| Lys | Lys | Asn | Ala | His | Ala | Leu | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly | | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | | |
| gat | gtg | atc | tgg | cta | gaa | aaa | caa | gct | aaa | gaa | tgg | ctc | aaa | ttg | taa | 768 | |
| Asp | Val | Ile | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | * | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | |

<210> 18
 <211> 255
 <212> PRT
 <213> H. pylori

| | | | | | | | | | | | | | | | | | |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| <400> 18 | | | | | | | | | | | | | | | | | |
| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Leu | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | | |
| | | 20 | | | | | | 25 | | | | | 30 | | | | |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Gln | Ile | Lys | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | | |
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser | | |
| | | | 85 | | | | | | 90 | | | | | 95 | | | |
| Ile | Leu | Ala | Ile | Lys | Gln | Gln | Val | Lys | Asp | Lys | Asn | Ala | Pro | Ile | Leu | | |
| | | 100 | | | | | | 105 | | | | | 110 | | | | |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Leu | Lys | Arg | Gln | Gly | Tyr | Leu | Asn | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | | |
| | | 130 | | | | 135 | | | | | 140 | | | | | | |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Ser | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | |

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Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
                                165                                170                                175
Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
                                180                                185                                190
Gly Tyr Phe Met Glu His Phe Ala Phe Pro Thr Pro Pro Leu Leu Ile
                                195                                200                                205
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
                                210                                215                                220
Lys Lys Asn Ala His Ala Leu Pro Lys Val Glu Phe His Ala Ser Gly
225                                230                                235                                240
Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu
                                245                                250                                255

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<210> 19
 <211> 768
 <212> DNA
 <213> H. pylori

<220>
 <221> CDS
 <222> (1)...(768)

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<400> 19
atg aaa ata ggc gtt ttt gat agc ggt gtg gga ggg ttt agc gtt tta 48
Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
  1                                5                                10                                15

aaa agc ctt tta aaa gcg caa tta ttt gat gaa atc atc tat tat ggc 96
Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
                                20                                25                                30

gat agc gct aga gtg cct tat ggc act aaa gac ccc acc acg atc aag 144
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
                                35                                40                                45

caa ttt ggc tta gag gct ttg gat ttt ttc aaa ccg cac cag att aaa 192
Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
  50                                55                                60

tta ttg att gtg gca tgc aac aca gcg agc gct cta gct tta gaa gag 240
Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
  65                                70                                75                                80

atg caa aag cat tcc aaa atc cct att gtg ggc gtg att gag cca agc 288
Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
                                85                                90                                95

att tta gcg atc aaa caa caa gta aag gat aaa aac gcc ccc att tta 336
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
                                100                                105                                110

gtg cta ggg aca aaa gcg acg att caa tct aac gct tac gat aac gct 384
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
                                115                                120                                125

ctg aaa caa caa ggc tat ttg aac gtt tcg cat tta gcc act tct ott 432
Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
  130                                135                                140

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```

ttt gtg cct ttg att gaa gaa aat att tta gag ggc gaa ttg tta gaa 480
Phe Val Pro Leu Ile Glu Glu Asn Ile Leu Glu Gly Glu Leu Leu Glu
145          150          155          160

act tgc atg cgt tat tat ttc act ccc tta gag att tta cct gaa gtg 528
Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
          165          170          175

atc att tta ggt tgc acg cat ttt ccc tta atc gct caa aaa att gag 576
Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
          180          185          190

ggc tat ttc atg ggg cat ttt gcc ctt cca acg ccc ccc ata ctc atc 624
Gly Tyr Phe Met Gly His Phe Ala Leu Pro Thr Pro Pro Ile Leu Ile
          195          200          205

cat tct ggc gac gct att gta gaa tat ttg caa caa aaa tac gcc ctt 672
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
          210          215          220

aag aaa aat gca cac gca ttc cct aaa gtg gaa ttt cat gcg agc ggc 720
Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225          230          235          240

gat atg atc tgg cta gaa aaa caa gct aaa gaa tgg ctc aaa ttg taa 768
Asp Met Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu *
          245          250          255

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<210> 20
 <211> 255
 <212> PRT
 <213> H. pylori

```

<400> 20
Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
1      5      10      15
Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
20      25      30
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
35      40      45
Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
50      55      60
Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65      70      75      80
Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85      90      95
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
100     105     110
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115     120     125
Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
130     135     140
Phe Val Pro Leu Ile Glu Asn Ile Leu Glu Gly Glu Leu Leu Glu
145     150     155     160
Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
          165          170          175

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| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | Gln | Lys | Ile | Glu |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Gly | Tyr | Phe | Met | Gly | His | Phe | Ala | Leu | Pro | Thr | Pro | Pro | Ile | Leu | Ile |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Lys | Lys | Asn | Ala | His | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Asp | Met | Ile | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | |
| | | | | 245 | | | | | 250 | | | | | 255 | |

<210> 21
 <211> 768
 <212> DNA
 <213> H. pylori

<220>
 <221> CDS
 <222> (1)...(768)

| | | | | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| <400> 21 | | | | | | | | | | | | | | | | |
| atg | aaa | ata | ggc | ggt | ttt | gat | agc | ggg | gtg | gga | ggg | ttt | agc | ggt | tta | 48 |
| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| aaa agc ctt tta aaa gcg caa tta ttt gat gaa atc atc tat tat ggc | | | | | | | | | | | | | | | 96 | |
| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Leu | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| gat agc gct aga gtg cct tat ggc act aaa gac ccc acc acg atc aag | | | | | | | | | | | | | | | 144 | |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | |
| | | | 35 | | | | 40 | | | | | 45 | | | | |
| caa ttt ggc tta gag gct ttg gat ttt ttc aaa ccg cac cag att aaa | | | | | | | | | | | | | | | 192 | |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Gln | Ile | Lys | |
| | | | 50 | | | | 55 | | | | 60 | | | | | |
| tta ttg att gta gca tgc aac aca gcg agc gct cta gct tta gaa gag | | | | | | | | | | | | | | | 240 | |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | |
| | | | 65 | | | 70 | | | | 75 | | | | 80 | | |
| atg caa aag cat tcc aaa atc cct att gtg ggc gtg att gag cca agc | | | | | | | | | | | | | | | 288 | |
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| att tta gcg atc aaa caa caa gta aaa gat aaa aac gcc cct att tta | | | | | | | | | | | | | | | 336 | |
| Ile | Leu | Ala | Ile | Lys | Gln | Gln | Val | Lys | Asp | Lys | Asn | Ala | Pro | Ile | Leu | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| gtg cta ggg aca aaa gcg acg att caa tct aac gct tat gac aac gcc | | | | | | | | | | | | | | | 384 | |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | |
| | | | 115 | | | | 120 | | | | | 125 | | | | |
| ctg aaa caa caa ggc tat ttg aat gtt tcg cat tta gcc act tct ctt | | | | | | | | | | | | | | | 432 | |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Asn | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | |
| | | | 130 | | | | 135 | | | | | 140 | | | | |
| ttt gtg cct ttg att gaa gaa agt att tta gag ggc gaa ttg tta gaa | | | | | | | | | | | | | | | 480 | |

Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
 145 150 155 160
 act tgc atg cgt tat tat ttc act ccc tta aag att tta cct gaa gtg 528
 Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
 165 170 175
 att att tta ggt tgc acg cat ttt ccc ttg atc gct caa aaa att gag 576
 Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
 180 185 190
 agc tat ttt atg ggg cat ttt gcc ctt cca acg ccc ccc cta ctc atc 624
 Ser Tyr Phe Met Gly His Phe Ala Leu Pro Thr Pro Pro Leu Leu Ile
 195 200 205
 cat tct ggc gat gct att gtg gaa tat ttg cag caa aaa tac gcc ctt 672
 His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
 210 215 220
 aag aaa aac gca cac gca ttc cct aaa gtg gaa ttt cat gcg agc ggc 720
 Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
 225 230 235 240
 gat gtg atc tgg cta gaa aaa caa gct aaa gaa tgg ctc aaa ttg taa 768
 Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu *
 245 250 255

<210> 22
 <211> 255
 <212> PRT
 <213> H. pylori

<400> 22
 Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
 1 5 10 15
 Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
 20 25 30
 Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
 35 40 45
 Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Lys
 50 55 60
 Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
 65 70 75 80
 Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
 85 90 95
 Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
 100 105 110
 Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
 115 120 125
 Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
 130 135 140
 Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
 145 150 155 160
 Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Lys Ile Leu Pro Glu Val
 165 170 175
 Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
 180 185 190

```

Ser Tyr Phe Met Gly His Phe Ala Leu Pro Thr Pro Pro Leu Leu Ile
      195      200      205
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
      210      215      220
Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
      225      230      235      240
Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu
      245      250      255

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<210> 23
 <211> 768
 <212> DNA
 <213> H. pylori

<220>
 <221> CDS
 <222> (1)...(768)

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<400> 23
atg aaa ata ggc gtt ttt gat agc ggt gtg gga ggg ttt agc gtt tta 48
Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
  1      5      10      15

aaa agc ctt tta aaa gcg caa cta ttt gat gaa atc atc tat tat ggc 96
Lys Ser Leu Leu Lys Ala Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
      20      25      30

gat agc gct aga gtg cct tat ggc act aaa gac ccc acc acg atc aag 144
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
      35      40      45

caa ttt ggc tta gag gct ttg gat ttt ttc aaa ccg cac cag att gga 192
Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Gly
      50      55      60

tta ttg att gtg gca tgc aac aca gcg agc gct ctg gct tta gaa gag 240
Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
      65      70      75      80

atg caa aaa tat tcc aaa atc cct att gtg ggc gtg att gag cca agc 288
Met Gln Lys Tyr Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
      85      90      95

att tta gcg atc aaa caa caa gta aaa gat aaa aac gcc ccc att tta 336
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
      100      105      110

gtg cta ggg aca aaa gcg acg atc caa tct aac gct tat gat aac gcc 384
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
      115      120      125

ctg aaa caa caa ggc tat ttg aac att tcg cat tta gcc act tct ctt 432
Leu Lys Gln Gln Gly Tyr Leu Asn Ile Ser His Leu Ala Thr Ser Leu
      130      135      140

ttt gtg ccc ttg att gaa gaa agt att tta gag ggc gaa ttg tta gaa 480
Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
      145      150      155      160

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act tgc atg cgt tat tat ttc act cca tta gag att tta cct gaa gtg 528
Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
165 170 175

atc att tta ggt tgc acg cat ttt ccc ttg atc gct caa aaa att gag 576
Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190

agc tat ttt atg gag cat ttt gcc ctt tca acg ccc ccc tta ctc atc 624
Ser Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
195 200 205

cat tct ggc gat gct att gtg gaa tac ttg caa caa aaa tac gcc ctt 672
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
210 215 220

aag aaa aac gca cac gca ttc cct aaa gtg gaa ttt cat gcg agc ggc 720
Lys Lys Asn Ala His Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
225 230 235 240

gat gtg atc tgg cta gaa aaa cag gct aaa gaa tgg ctc aaa ttg taa 768
Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu *
245 250 255

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<210> 24
 <211> 255
 <212> PRT
 <213> H. pylori

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20 25 30
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
35 40 45
Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Gly
50 55 60
Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
65 70 75 80
Met Gln Lys Tyr Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
85 90 95
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
100 105 110
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
115 120 125
Leu Lys Gln Gln Gly Tyr Leu Asn Ile Ser His Leu Ala Thr Ser Leu
130 135 140
Phe Val Pro Leu Ile Glu Glu Ser Ile Leu Glu Gly Glu Leu Leu Glu
145 150 155 160
Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
165 170 175
Ile Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala Gln Lys Ile Glu
180 185 190
Ser Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
195 200 205

```


| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu |
| | 210 | | | | | 215 | | | | 220 | | | | | |
| Lys | Lys | Asn | Ala | His | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Asp | Val | Ile | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | |
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 <212> DNA
 <213> H. pylori

<220>
 <221> CDS
 <222> (1)...(768)

<400> 25

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| atg | aaa | ata | ggc | gtt | ttt | gat | agc | ggg | gtg | gga | ggg | ttt | agc | gtt | tta | 48 |
| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| | | | | | | | | | | | | | | | | |
| aaa | agc | ctt | tta | aaa | gcg | caa | tta | ttt | gat | gaa | atc | atc | tat | tat | ggc | 96 |
| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Leu | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| | | | | | | | | | | | | | | | | |
| gat | agc | gct | aga | gtg | cct | tat | ggc | act | aaa | gac | ccc | acc | acg | atc | aag | 144 |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | |
| | | | 35 | | | | 40 | | | | | 45 | | | | |
| | | | | | | | | | | | | | | | | |
| caa | ttt | ggc | tta | gag | gct | ttg | gat | ttt | ttc | aaa | ccg | cac | aaa | att | gaa | 192 |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Lys | Ile | Glu | |
| | | | 50 | | | | 55 | | | | 60 | | | | | |
| | | | | | | | | | | | | | | | | |
| tta | tta | att | gtg | gca | tgc | aac | aca | gcg | agc | gct | ctg | gct | tta | gaa | gag | 240 |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | |
| | | | 65 | | | 70 | | | | 75 | | | | 80 | | |
| | | | | | | | | | | | | | | | | |
| atg | caa | aag | cat | tcc | aaa | atc | ccc | att | gtg | ggc | gtg | att | gag | cca | agc | 288 |
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| | | | | | | | | | | | | | | | | |
| att | tta | gcg | atc | aaa | caa | caa | gtg | aaa | gat | aaa | aac | acc | cct | att | tta | 336 |
| Ile | Leu | Ala | Ile | Lys | Gln | Gln | Val | Lys | Asp | Lys | Asn | Thr | Pro | Ile | Leu | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| | | | | | | | | | | | | | | | | |
| gtg | cta | ggg | aca | aaa | gcg | acg | atc | caa | tct | aac | gct | tac | gat | aac | gcc | 384 |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | |
| | | | 115 | | | | 120 | | | | | 125 | | | | |
| | | | | | | | | | | | | | | | | |
| ctg | aaa | caa | caa | ggc | tat | ttg | aag | gtt | tcg | cat | ttg | gcc | act | tct | ctt | 432 |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Lys | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | |
| | | | 130 | | | 135 | | | | | 140 | | | | | |
| | | | | | | | | | | | | | | | | |
| ttt | gtg | cct | ttg | att | gaa | gaa | agt | att | tta | gag | ggc | gaa | ttg | tta | gaa | 480 |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Ser | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | |
| | | | | | 150 | | | | | 155 | | | | | 160 | |
| | | | | | | | | | | | | | | | | |
| act | tgc | atg | cgt | tat | tat | ttc | act | cca | tta | gaa | atc | tta | cct | gaa | gtg | 528 |

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Glu | Ile | Leu | Pro | Glu | Val | | |
| | | | | 165 | | | | | 170 | | | | | 175 | | | |
| gtt | att | tta | ggc | tgc | acg | cat | ttt | ccc | ttg | atc | gct | caa | aaa | att | gag | 576 | |
| Val | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | Gln | Lys | Ile | Glu | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| ggc | tat | ttt | atg | gaa | cat | ttt | gcc | ctt | cca | acg | ccc | ccc | cta | ctc | atc | 624 | |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Pro | Thr | Pro | Pro | Leu | Leu | Ile | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| cat | tct | ggc | gac | gct | att | gtg | gga | tat | ttg | cag | caa | aaa | tac | gcc | ctt | 672 | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Gly | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| aag | aaa | aac | gca | cac | gca | ttc | cct | aaa | gtg | gaa | ttt | cat | gcg | agc | ggc | 720 | |
| Lys | Lys | Asn | Ala | His | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly | | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | | |
| gat | gta | att | tgg | cta | gaa | aaa | cag | gct | aaa | gaa | tgg | ctc | aaa | ttg | taa | 768 | |
| Asp | Val | Ile | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | * | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | |

<210> 26
 <211> 255
 <212> PRT
 <213> H. pylori

<400> 26

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Leu | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | | |
| | | | 20 | | | | | 25 | | | | | 30 | | | | |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Lys | Ile | Glu | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | | |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | | | |
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser | | |
| | | | 85 | | | | | | 90 | | | | | 95 | | | |
| Ile | Leu | Ala | Ile | Lys | Gln | Gln | Val | Lys | Asp | Lys | Asn | Thr | Pro | Ile | Leu | | |
| | | | 100 | | | | | 105 | | | | | 110 | | | | |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Lys | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Ser | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | |
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Glu | Ile | Leu | Pro | Glu | Val | | |
| | | | | 165 | | | | | 170 | | | | | 175 | | | |
| Val | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | Gln | Lys | Ile | Glu | | |
| | | 180 | | | | | | 185 | | | | | 190 | | | | |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Pro | Thr | Pro | Pro | Leu | Leu | Ile | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Gly | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Lys | Asn | Ala | His | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Asp | Val | Ile | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | |
| | | | | 245 | | | | | 250 | | | | | 255 | |

<210> 27
 <211> 768
 <212> DNA
 <213> H. pylori

<220>
 <221> CDS
 <222> (1)...(768)

<400> 27

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| atg | aaa | ata | ggc | gtt | ttt | gat | agc | ggg | gtg | gga | ggg | ttt | agc | gtt | tta | 48 |
| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| | | | | | | | | | | | | | | | | |
| aaa | agc | ctt | tta | aaa | gcg | caa | att | ttt | gat | gaa | atc | atc | tat | tat | ggc | 96 |
| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Ile | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| | | | | | | | | | | | | | | | | |
| gat | agc | gct | agg | gtg | cct | tat | ggc | act | aaa | gac | ccc | acc | acg | atc | aag | 144 |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |
| | | | | | | | | | | | | | | | | |
| caa | ttt | ggc | tta | gag | gct | ttg | gat | ttt | ttc | aaa | ccg | cac | aag | att | gaa | 192 |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Lys | Ile | Glu | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |
| | | | | | | | | | | | | | | | | |
| tta | ttg | att | gtg | gca | tgc | aac | aca | gcg | agc | gct | cta | gct | tta | gaa | gaa | 240 |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | | |
| | | | | | | | | | | | | | | | | |
| atg | caa | aag | cat | tcc | aaa | atc | cct | att | gtg | ggc | gtg | att | gaa | cca | agc | 288 |
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| | | | | | | | | | | | | | | | | |
| att | tta | gcg | atc | aaa | caa | caa | gta | aaa | gat | aaa | aac | gcc | cct | att | tta | 336 |
| Ile | Leu | Ala | Ile | Lys | Gln | Gln | Val | Lys | Asp | Lys | Asn | Ala | Pro | Ile | Leu | |
| | | 100 | | | | | | 105 | | | | | 110 | | | |
| | | | | | | | | | | | | | | | | |
| gtg | cta | ggg | aca | aaa | gcg | acg | att | caa | tct | aac | gct | tat | gac | aac | gcc | 384 |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | |
| | | 115 | | | | | 120 | | | | | 125 | | | | |
| | | | | | | | | | | | | | | | | |
| ctg | aaa | caa | caa | ggc | tat | ttg | aat | gtt | tcg | cat | tta | gcc | act | tct | ott | 432 |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Asn | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| | | | | | | | | | | | | | | | | |
| ttt | gtg | cct | ttg | att | gaa | gaa | aat | att | tta | gag | ggc | gaa | ttg | cta | gaa | 480 |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Asn | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |
| | | | | | | | | | | | | | | | | |
| act | tgc | atg | cgt | tat | tat | ttc | act | cca | tta | gag | atc | ttg | cct | gaa | gtg | 528 |
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Glu | Ile | Leu | Pro | Glu | Val | |
| | | | | 165 | | | | | 170 | | | | | 175 | | |

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gtt att tta ggc tgc acg cat ttt ccc ttg atc gct cac caa att gag 576
Val Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala His Gln Ile Glu
      180      185      190

ggc tat ttt atg gag cat ttt gcc ctt tca acg ccc ccc cta ctc atc 624
Gly Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
      195      200      205

cat tct ggc gat gct att gtg gaa tat ttg cag caa aaa tac gcc ctt 672
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
      210      215      220

aag aaa aac gca tgt gca ttc cct aaa gta gaa ttt cat gcg agc ggc 720
Lys Lys Asn Ala Cys Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
      225      230      235      240

gat gta att tgg cta gaa aaa cag gct aaa gaa tgg ctc aaa ttg taa 768
Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu *
      245      250      255

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<210> 28
 <211> 255
 <212> PRT
 <213> H. pylori

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<400> 28
Met Lys Ile Gly Val Phe Asp Ser Gly Val Gly Gly Phe Ser Val Leu
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Lys Ser Leu Leu Lys Ala Gln Ile Phe Asp Glu Ile Ile Tyr Tyr Gly
      20      25      30
Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
      35      40      45
Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Lys Ile Glu
      50      55      60
Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
      65      70      75      80
Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
      85      90      95
Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
      100      105      110
Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
      115      120      125
Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
      130      135      140
Phe Val Pro Leu Ile Glu Glu Asn Ile Leu Glu Gly Glu Leu Leu Glu
      145      150      155      160
Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
      165      170      175
Val Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala His Gln Ile Glu
      180      185      190
Gly Tyr Phe Met Glu His Phe Ala Leu Ser Thr Pro Pro Leu Leu Ile
      195      200      205
His Ser Gly Asp Ala Ile Val Glu Tyr Leu Gln Gln Lys Tyr Ala Leu
      210      215      220
Lys Lys Asn Ala Cys Ala Phe Pro Lys Val Glu Phe His Ala Ser Gly
      225      230      235      240

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Asp Val Ile Trp Leu Glu Lys Gln Ala Lys Glu Trp Leu Lys Leu
 245 250 255

<210> 29
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 <213> H. pylori

<220>
 <221> CDS
 <222> (1)...(768)

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 aaa agc ctt tta aaa gtg caa tta ttt gat gaa atc atc tat tat ggc 96
 Lys Ser Leu Leu Lys Val Gln Leu Phe Asp Glu Ile Ile Tyr Tyr Gly
 20 25 30
 gat agt gct agg gtg cct tat ggc act aaa gac ccc acc acg atc aag 144
 Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
 35 40 45
 caa ttt ggc tta gag gct ttg gat ttt ttc aaa ccg cac aag att gaa 192
 Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Lys Ile Glu
 50 55 60
 tta ttg att gtg gca tgc aac aca gcg agc gct cta gct tta gga gag 240
 Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Gly Glu
 65 70 75 80
 atg caa aag tat tcc aaa atc cct att gtg ggc gtg att gag cca agc 288
 Met Gln Lys Tyr Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
 85 90 95
 att tta gcg atc aaa caa caa gta aaa gat aaa aac gcc cct att tta 336
 Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
 100 105 110
 gta cta ggg aca aaa gcg acg att cga tcc aac gct tat gac aac gcc 384
 Val Leu Gly Thr Lys Ala Thr Ile Arg Ser Asn Ala Tyr Asp Asn Ala
 115 120 125
 ctg aaa caa caa ggc tat ttg aat att tcg cat tta gcc act tct ctt 432
 Leu Lys Gln Gln Gly Tyr Leu Asn Ile Ser His Leu Ala Thr Ser Leu
 130 135 140
 ttt gtg cct ttg att gaa gaa aat att tta gag ggc gaa ttg cta gaa 480
 Phe Val Pro Leu Ile Glu Glu Asn Ile Leu Glu Gly Glu Leu Leu Glu
 145 150 155 160
 act tgc atg cgt tat tat ttc act cca tta gag att tta cct gaa gtg 528
 Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
 165 170 175
 gtt att tta ggt tgc acg cat ttt ccc ttg atc gct cac caa att gag 576

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Val | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | His | Gln | Ile | Glu | | |
| | | | 180 | | | | | 185 | | | | | 190 | | | | |
| ggc | tat | ttt | atg | gag | cat | ttt | gcc | ctt | tca | acg | ccc | ccc | cta | ctc | atc | 624 | |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Ser | Thr | Pro | Pro | Leu | Leu | Ile | | |
| | | 195 | | | | | 200 | | | | 205 | | | | | | |
| cat | tct | ggc | gat | gct | att | gtg | gaa | tat | ttg | caa | caa | aaa | tac | gcc | ctt | 672 | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
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| Lys | Lys | Asn | Ala | Cys | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly | | |
| 225 | | | | 230 | | | | | 235 | | | | | | 240 | | |
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| Asp | Val | Ile | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | * | | |
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 <213> H. pylori

<400> 30

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| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | | |
| Lys | Ser | Leu | Leu | Lys | Val | Gln | Leu | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | | |
| | | 20 | | | | | | 25 | | | | | 30 | | | | |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Lys | Ile | Glu | | |
| | 50 | | | | 55 | | | | | | 60 | | | | | | |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Gly | Glu | | |
| 65 | | | | | 70 | | | | 75 | | | | | 80 | | | |
| Met | Gln | Lys | Tyr | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser | | |
| | | | 85 | | | | | | 90 | | | | | 95 | | | |
| Ile | Leu | Ala | Ile | Lys | Gln | Gln | Val | Lys | Asp | Lys | Asn | Ala | Pro | Ile | Leu | | |
| | | 100 | | | | | | 105 | | | | | 110 | | | | |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Arg | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | | |
| | 115 | | | | | 120 | | | | | | 125 | | | | | |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Asn | Ile | Ser | His | Leu | Ala | Thr | Ser | Leu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Asn | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | | |
| 145 | | | | | 150 | | | | 155 | | | | | | 160 | | |
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Glu | Ile | Leu | Pro | Glu | Val | | |
| | | | 165 | | | | | 170 | | | | | | 175 | | | |
| Val | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | His | Gln | Ile | Glu | | |
| | | 180 | | | | | | 185 | | | | | 190 | | | | |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Ser | Thr | Pro | Pro | Leu | Leu | Ile | | |
| | 195 | | | | | | 200 | | | | | 205 | | | | | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Lys | Tyr | Ala | Leu | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Lys | Lys | Asn | Ala | Cys | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly | | |
| 225 | | | | 230 | | | | | 235 | | | | | | 240 | | |
| Asp | Val | Ile | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | | | |
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aaa agc ctt tta aaa gcg caa att ttt gat gaa atc atc tat tat ggc 96
 Lys Ser Leu Leu Lys Ala Gln Ile Phe Asp Glu Ile Ile Tyr Tyr Gly
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gat agt gct aga gtg cct tat ggc act aaa gac ccc acc acg atc aag 144
 Asp Ser Ala Arg Val Pro Tyr Gly Thr Lys Asp Pro Thr Thr Ile Lys
 35 40 45

caa ttt ggc tta gag gct ttg gat ttt ttc aaa ccg cac cag att gga 192
 Gln Phe Gly Leu Glu Ala Leu Asp Phe Phe Lys Pro His Gln Ile Gly
 50 55 60

tta ttg att gtg gca tgc aac aca gcg agc gct cta gct tta gaa gag 240
 Leu Leu Ile Val Ala Cys Asn Thr Ala Ser Ala Leu Ala Leu Glu Glu
 65 70 75 80

atg caa aag cat tcc aaa atc cct att gtg ggt gtg att gag cca agc 288
 Met Gln Lys His Ser Lys Ile Pro Ile Val Gly Val Ile Glu Pro Ser
 85 90 95

att tta gcg atc aaa caa caa gta aaa gat aaa aac gcc cct att tta 336
 Ile Leu Ala Ile Lys Gln Gln Val Lys Asp Lys Asn Ala Pro Ile Leu
 100 105 110

gtg tta ggg aca aaa gcg acg att caa tcc aac gct tat gac aac gcc 384
 Val Leu Gly Thr Lys Ala Thr Ile Gln Ser Asn Ala Tyr Asp Asn Ala
 115 120 125

ctg aaa caa caa ggc tat ttg aac gtt tcg cat tta gcc act tct ctt 432
 Leu Lys Gln Gln Gly Tyr Leu Asn Val Ser His Leu Ala Thr Ser Leu
 130 135 140

ttt gtg cct ttg att gaa gaa aat att tta gag ggc gaa ttg tta gaa 480
 Phe Val Pro Leu Ile Glu Glu Asn Ile Leu Glu Gly Glu Leu Leu Glu
 145 150 155 160

act tgc atg cgt tat tat ttc act cca tta gag att tta cct gaa gtg 528
 Thr Cys Met Arg Tyr Tyr Phe Thr Pro Leu Glu Ile Leu Pro Glu Val
 165 170 175

gtt att tta ggt tgc acg cat ttt ccc ttg atc gct cac caa att gag 576
 Val Ile Leu Gly Cys Thr His Phe Pro Leu Ile Ala His Gln Ile Glu
 180 185 190

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ggc | tat | ttt | atg | gag | cat | ttt | gcc | ctt | tca | acg | ccc | ccc | tta | ctc | atc | 624 |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Ser | Thr | Pro | Pro | Leu | Leu | Ile | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| | | | | | | | | | | | | | | | | |
| cat | tct | ggc | gat | gct | att | gtg | gaa | tat | ttg | caa | caa | aaa | tac | acc | ctt | 672 |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Lys | Tyr | Thr | Leu | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| | | | | | | | | | | | | | | | | |
| aag | aaa | aat | gca | tgc | gcg | ttc | cct | aaa | gtg | gaa | ttt | cat | gcg | agc | ggc | 720 |
| Lys | Lys | Asn | Ala | Cys | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | |
| | | | | | | | | | | | | | | | | |
| gat | gtg | gtt | tgg | cta | gaa | aaa | cag | gct | aaa | gaa | tgg | ctc | aaa | ttg | taa | 768 |
| Asp | Val | Val | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | * | |
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| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Ile | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | |
| | | 20 | | | | | | 25 | | | | | 30 | | | |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Gln | Ile | Gly | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | |
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Ile | Val | Gly | Val | Ile | Glu | Pro | Ser | |
| | | | 85 | | | | | | 90 | | | | | 95 | | |
| Ile | Leu | Ala | Ile | Lys | Gln | Gln | Val | Lys | Asp | Lys | Asn | Ala | Pro | Ile | Leu | |
| | | 100 | | | | | | 105 | | | | | 110 | | | |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | |
| | | 115 | | | | | 120 | | | | | 125 | | | | |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Asn | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Asn | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Glu | Ile | Leu | Pro | Glu | Val | |
| | | | 165 | | | | | 170 | | | | | 175 | | | |
| Val | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | His | Gln | Ile | Glu | |
| | | 180 | | | | | | 185 | | | | | 190 | | | |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Ser | Thr | Pro | Pro | Leu | Leu | Ile | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Lys | Tyr | Thr | Leu | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| Lys | Lys | Asn | Ala | Cys | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | |
| Asp | Val | Val | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | | |
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<220>
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<400> 33

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| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| aaa | agc | ctt | tta | aaa | gcg | caa | cta | ttt | gat | gaa | atc | atc | tat | tat | ggc | 96 |
| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Leu | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| gat | agc | gct | aga | gtg | cct | tat | ggc | act | aaa | gac | ccc | acc | acg | atc | aag | 144 |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | |
| | | | 35 | | | | 40 | | | | | 45 | | | | |
| caa | ttt | ggc | tta | gag | gct | ttg | gat | ttt | ttc | aaa | ccg | cac | cag | att | aaa | 192 |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Gln | Ile | Lys | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |
| tta | ttg | att | gtg | gca | tgc | aac | acc | gca | agc | gct | ctg | gct | tta | gaa | gag | 240 |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | |
| | 65 | | | | 70 | | | | 75 | | | | | 80 | | |
| atg | caa | aag | cat | tcc | aaa | atc | cct | gtt | gtg | ggc | gtg | att | gag | cca | agc | 288 |
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Val | Val | Gly | Val | Ile | Glu | Pro | Ser | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| att | tta | gcg | atc | aaa | cgg | caa | gtg | aaa | gat | aaa | aac | gcc | cct | att | ttg | 336 |
| Ile | Leu | Ala | Ile | Lys | Arg | Gln | Val | Lys | Asp | Lys | Asn | Ala | Pro | Ile | Leu | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| gtg | cta | ggg | aca | aaa | gcg | acg | att | caa | tcc | aac | gcc | tat | gat | aac | gcc | 384 |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | |
| | | 115 | | | | | 120 | | | | | 125 | | | | |
| ctg | aaa | caa | caa | ggc | tat | ttg | aat | gtt | tcg | cat | tta | gcc | act | tct | ctt | 432 |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Asn | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| ttt | gtg | cct | ttg | att | gaa | gaa | agt | att | tta | gag | ggc | gaa | ttg | cta | gaa | 480 |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Ser | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | |
| | 145 | | | | 150 | | | | 155 | | | | | 160 | | |
| act | tgc | atg | cgt | tat | tat | ttc | act | cca | tta | gag | att | tta | cct | gaa | gtg | 528 |
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Glu | Ile | Leu | Pro | Glu | Val | |
| | | | | 165 | | | | 170 | | | | | | 175 | | |
| gtt | att | tta | ggg | tgc | acg | cat | ttt | ccc | ttg | atc | gct | caa | aaa | att | gag | 576 |
| Val | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | Gln | Lys | Ile | Glu | |
| | | | 180 | | | | | 185 | | | | | 190 | | | |
| ggc | tat | ttt | atg | gag | cat | ttt | gcc | ctt | tca | acg | ccc | ccc | cta | ctc | atc | 624 |

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Ser | Thr | Pro | Pro | Leu | Leu | Ile | | |
| | 195 | | | | | | 200 | | | | | 205 | | | | | |
| cat | tct | ggc | gat | gct | att | gtg | gaa | tat | ttg | caa | caa | aat | tac | gcc | ctt | 672 | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Asn | Tyr | Ala | Leu | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| aag | aaa | aac | gca | tgc | gcg | ttc | cct | aaa | gtg | gaa | ttt | cat | gcg | agc | ggc | 720 | |
| Lys | Lys | Asn | Ala | Cys | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly | | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | | |
| gat | gtg | gtt | tgg | cta | gaa | aaa | caa | gct | aaa | gaa | tgg | ctt | aaa | ttg | | 765 | |
| Asp | Val | Val | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | | | |
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 <211> 255
 <212> PRT
 <213> H. pylori

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| <400> 34 | | | | | | | | | | | | | | | | | |
| Met | Lys | Ile | Gly | Val | Phe | Asp | Ser | Gly | Val | Gly | Gly | Phe | Ser | Val | Leu | | |
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| Lys | Ser | Leu | Leu | Lys | Ala | Gln | Leu | Phe | Asp | Glu | Ile | Ile | Tyr | Tyr | Gly | | |
| | | 20 | | | | | | 25 | | | | | 30 | | | | |
| Asp | Ser | Ala | Arg | Val | Pro | Tyr | Gly | Thr | Lys | Asp | Pro | Thr | Thr | Ile | Lys | | |
| | | 35 | | | | | 40 | | | | | 45 | | | | | |
| Gln | Phe | Gly | Leu | Glu | Ala | Leu | Asp | Phe | Phe | Lys | Pro | His | Gln | Ile | Lys | | |
| | 50 | | | | | 55 | | | | | 60 | | | | | | |
| Leu | Leu | Ile | Val | Ala | Cys | Asn | Thr | Ala | Ser | Ala | Leu | Ala | Leu | Glu | Glu | | |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | | | |
| Met | Gln | Lys | His | Ser | Lys | Ile | Pro | Val | Val | Gly | Val | Ile | Glu | Pro | Ser | | |
| | | | 85 | | | | | | 90 | | | | 95 | | | | |
| Ile | Leu | Ala | Ile | Lys | Arg | Gln | Val | Lys | Asp | Lys | Asn | Ala | Pro | Ile | Leu | | |
| | | 100 | | | | | | 105 | | | | | 110 | | | | |
| Val | Leu | Gly | Thr | Lys | Ala | Thr | Ile | Gln | Ser | Asn | Ala | Tyr | Asp | Asn | Ala | | |
| | 115 | | | | | | 120 | | | | | 125 | | | | | |
| Leu | Lys | Gln | Gln | Gly | Tyr | Leu | Asn | Val | Ser | His | Leu | Ala | Thr | Ser | Leu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Phe | Val | Pro | Leu | Ile | Glu | Glu | Ser | Ile | Leu | Glu | Gly | Glu | Leu | Leu | Glu | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | |
| Thr | Cys | Met | Arg | Tyr | Tyr | Phe | Thr | Pro | Leu | Glu | Ile | Leu | Pro | Glu | Val | | |
| | | | 165 | | | | | | 170 | | | | | 175 | | | |
| Val | Ile | Leu | Gly | Cys | Thr | His | Phe | Pro | Leu | Ile | Ala | Gln | Lys | Ile | Glu | | |
| | | 180 | | | | | | 185 | | | | | 190 | | | | |
| Gly | Tyr | Phe | Met | Glu | His | Phe | Ala | Leu | Ser | Thr | Pro | Pro | Leu | Leu | Ile | | |
| | 195 | | | | | | 200 | | | | | 205 | | | | | |
| His | Ser | Gly | Asp | Ala | Ile | Val | Glu | Tyr | Leu | Gln | Gln | Asn | Tyr | Ala | Leu | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Lys | Lys | Asn | Ala | Cys | Ala | Phe | Pro | Lys | Val | Glu | Phe | His | Ala | Ser | Gly | | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | | |
| Asp | Val | Val | Trp | Leu | Glu | Lys | Gln | Ala | Lys | Glu | Trp | Leu | Lys | Leu | | | |
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 cctgcattac gcgaaaagtt cgacttcccg gttgttggtg tcgtgccggc gattaaacct 360
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 gatgcactaa aacgtatcct acgcccgtgg ttaagaatga aagagccgcc agataccggt 600
 gtattgggtt gcacccattt cctctacta caagaagaac tgttacaagt gctgccagag 660
 ggaacccggc tgggtggattc tggcgacgc attgctcgcc gaacggcctg gttgttagaa 720
 catgaagccc cggatgcaaa atctgccgat gcgaatattg ccttttgtat ggcaatgacg 780
 ccaggagctg aacaattatt gcccgtttta cagcgttacg gcttcgaaac gctcgaaaaa 840
 ctggcagttt taggctga 858

<210> 40
 <211> 285
 <212> PRT
 <213> E. coli

<400> 40

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Thr | Lys | Leu | Gln | Asp | Gly | Asn | Thr | Pro | Cys | Leu | Ala | Ala | Thr |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Pro | Ser | Glu | Pro | Arg | Pro | Thr | Val | Leu | Val | Phe | Asp | Ser | Gly | Val | Gly |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Gly | Leu | Ser | Val | Tyr | Asp | Glu | Ile | Arg | His | Leu | Leu | Pro | Asp | Leu | His |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Tyr | Ile | Tyr | Ala | Phe | Asp | Asn | Val | Ala | Phe | Pro | Tyr | Gly | Glu | Lys | Ser |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Glu | Ala | Phe | Ile | Val | Glu | Arg | Val | Val | Ala | Ile | Val | Thr | Ala | Val | Gln |
| 65 | | | | | 70 | | | | 75 | | | | | | 80 |
| Glu | Arg | Tyr | Pro | Leu | Ala | Leu | Ala | Val | Val | Ala | Cys | Asn | Thr | Ala | Ser |
| | | | 85 | | | | | 90 | | | | | | 95 | |
| Thr | Val | Ser | Leu | Pro | Ala | Leu | Arg | Glu | Lys | Phe | Asp | Phe | Pro | Val | Val |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Gly | Val | Val | Pro | Ala | Ile | Lys | Pro | Ala | Ala | Arg | Leu | Thr | Ala | Asn | Gly |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Ile | Val | Gly | Leu | Leu | Ala | Thr | Arg | Gly | Thr | Val | Lys | Arg | Ser | Tyr | Thr |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| His | Glu | Leu | Ile | Ala | Arg | Phe | Ala | Asn | Glu | Cys | Gln | Ile | Glu | Met | Leu |
| 145 | | | | | 150 | | | | 155 | | | | | | 160 |
| Gly | Ser | Ala | Glu | Met | Val | Glu | Leu | Ala | Glu | Ala | Lys | Leu | His | Gly | Glu |
| | | | 165 | | | | | 170 | | | | | 175 | | |
| Asp | Val | Ser | Leu | Asp | Ala | Leu | Lys | Arg | Ile | Leu | Arg | Pro | Trp | Leu | Arg |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Met | Lys | Glu | Pro | Pro | Asp | Thr | Val | Val | Leu | Gly | Cys | Thr | His | Phe | Pro |
| | 195 | | | | | 200 | | | | | | 205 | | | |
| Leu | Leu | Gln | Glu | Glu | Leu | Leu | Gln | Val | Leu | Pro | Glu | Gly | Thr | Arg | Leu |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Val | Asp | Ser | Gly | Ala | Ala | Ile | Ala | Arg | Arg | Thr | Ala | Trp | Leu | Leu | Glu |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| His | Glu | Ala | Pro | Asp | Ala | Lys | Ser | Ala | Asp | Ala | Asn | Ile | Ala | Phe | Cys |
| | | | 245 | | | | | 250 | | | | | 255 | | |
| Met | Ala | Met | Thr | Pro | Gly | Ala | Glu | Gln | Leu | Leu | Pro | Val | Leu | Gln | Arg |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Tyr | Gly | Phe | Glu | Thr | Leu | Glu | Lys | Leu | Ala | Val | Leu | Gly | | | |
| | 275 | | | | | | 280 | | | | | 285 | | | |

<210> 41
 <211> 29
 <212> DNA
 <213> Homo sapiens

<400> 41
 aaatagtcac atgaaaatag gcgttttttg

29

<210> 42
 <211> 28
 <212> DNA
 <213> Homo sapiens

<400> 42
 agaattctat tacaatttga gccattct

28

<210> 43
 <211> 822
 <212> DNA
 <213> E. faecalis

<400> 43

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atgagcaatc aagaagccat tggattaatt gattctggcg ttggtggatt aactgtttta 60
aaggaagcgc taaagcaatt accaaatgaa cgattaattt atttaggaga tacagcccgt 120
tgcccatatg gtccacgacc agccgaacaa gtcgttcagt ttacttggga aatggccgat 180
tttttattga aaaaacgaat aaaaatgcta gtaatcgcat gtaataccgc gacggctgtc 240
gcattagaag aaattaaagc tgccttgcca attccagttg ttggtgttat tttacctggc 300
gcacgagcag ccgttaaagt cacaaaaaat aacaaaattg gtgtcatagg taccttaggg 360
acaatcaaaa gtgcttccta tgaaatcgcc attaaaagta aggcaccagc aattgaggtg 420
actagtttag cttgccctaa atttgtcccc attggtgaaa gtaatcaata tcgttcttcc 480
gtagcaaaaa aaattgtggc agaaacactt caagcactac aattaaaagg acttgatacg 540
ttgatttttag gttgtaccca ttaccggttg ttacgtccgg tgattcaaaa tgtgatgggg 600
agtcatgtga cattaattga ctcaggagcc gaaacagttg gcgaagtcag catgcttctc 660
gattattttg acattgcccc cacgcctgaa gcgcctacac agcccatga attttataca 720
actggttctg caaaaatggt tgaagagatt gcaagcagtt ggcttggtat agagaactta 780
aaagcacaac agattcactt aggaggaaac gaaaatgatt ag 822

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<210> 44

<211> 273

<212> PRT

<213> E. faecalis

<400> 44

```

Met Ser Asn Gln Glu Ala Ile Gly Leu Ile Asp Ser Gly Val Gly Gly
 1          5          10          15
Leu Thr Val Leu Lys Glu Ala Leu Lys Gln Leu Pro Asn Glu Arg Leu
 20          25          30
Ile Tyr Leu Gly Asp Thr Ala Arg Cys Pro Tyr Gly Pro Arg Pro Ala
 35          40          45
Glu Gln Val Val Gln Phe Thr Trp Glu Met Ala Asp Phe Leu Leu Lys
 50          55          60
Lys Arg Ile Lys Met Leu Val Ile Ala Cys Asn Thr Ala Thr Ala Val
 65          70          75          80
Ala Leu Glu Glu Ile Lys Ala Ala Leu Pro Ile Pro Val Val Gly Val
 85          90          95
Ile Leu Pro Gly Ala Arg Ala Ala Val Lys Val Thr Lys Asn Asn Lys
100          105          110
Ile Gly Val Ile Gly Thr Leu Gly Thr Ile Lys Ser Ala Ser Tyr Glu
115          120          125
Ile Ala Ile Lys Ser Lys Ala Pro Ala Ile Glu Val Thr Ser Leu Ala
130          135          140
Cys Pro Lys Phe Val Pro Ile Val Glu Ser Asn Gln Tyr Arg Ser Ser
145          150          155          160
Val Ala Lys Lys Ile Val Ala Glu Thr Leu Gln Ala Leu Gln Leu Lys
165          170          175
Gly Leu Asp Thr Leu Ile Leu Gly Cys Thr His Tyr Pro Leu Leu Arg
180          185          190
Pro Val Ile Gln Asn Val Met Gly Ser His Val Thr Leu Ile Asp Ser
195          200          205
Gly Ala Glu Thr Val Gly Glu Val Ser Met Leu Leu Asp Tyr Phe Asp
210          215          220
Ile Ala His Thr Pro Glu Ala Pro Thr Gln Pro His Glu Phe Tyr Thr
225          230          235          240
Thr Gly Ser Ala Lys Met Phe Glu Glu Ile Ala Ser Ser Trp Leu Gly
245          250          255
Ile Glu Asn Leu Lys Ala Gln Gln Ile His Leu Gly Gly Asn Glu Asn
260          265          270
Asp

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<210> 45
 <211> 801
 <212> DNA
 <213> S. aureus

<400> 45
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 attatgcgtc agttgccaaa tgagacgatt tattacttag gtgatattgg gcgatgtcca 120
 tatgggccaa gaccaggaga acaagtaaaa caatatacag ttgaaatcgc tcgtaaatta 180
 atggaatttg atataaaaat gctcgtgatt gcttgtaata ctgcaactgc tgtagcttta 240
 gaatattttac aaaagacctt atcaatctca gtgattggcg taattgaacc aggtgctaga 300
 acagcaataa tgacgactag aaatcaaaaat gtattagtac taggaacgga aggcacaatt 360
 aaatctgaag catatcgaac acatattaaa cgtataaatc cacatgtaga ggtacatggc 420
 gttgcctgtc caggttttgt gccacttgta gaacaaatga gatatagtga tccaacaatt 480
 acaagcattg ttattcatca aacactgaaa cgttggcgta atagtgaagtc tgatactgtc 540
 atttttaggat gtaccacta tccattgctc tataaaccta tctatgatta ttttggtggt 600
 aaaaagacag tgatttcgtc tggattagaa acggctcgtg aagttagtgc attgctaaca 660
 ttttagtaatg aacatgcaag ttatactgaa catccagatc atcgattttt tgcaacaggt 720
 gataccacac atattactaa cattatcaaa gaatggctaa atttatctgt caatgtggaa 780
 cgtatatcag tgaatgacta g 801

<210> 46
 <211> 266
 <212> PRT
 <213> S. aureus

<400> 46
 Met Asn Lys Pro Ile Gly Val Ile Asp Ser Gly Val Gly Gly Leu Thr
 1 5 10 15
 Val Ala Lys Glu Ile Met Arg Gln Leu Pro Asn Glu Thr Ile Tyr Tyr
 20 25 30
 Leu Gly Asp Ile Gly Arg Cys Pro Tyr Gly Pro Arg Pro Gly Glu Gln
 35 40 45
 Val Lys Gln Tyr Thr Val Glu Ile Ala Arg Lys Leu Met Glu Phe Asp
 50 55 60
 Ile Lys Met Leu Val Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu
 65 70 75 80
 Glu Tyr Leu Gln Lys Thr Leu Ser Ile Ser Val Ile Gly Val Ile Glu
 85 90 95
 Pro Gly Ala Arg Thr Ala Ile Met Thr Thr Arg Asn Gln Asn Val Leu
 100 105 110
 Val Leu Gly Thr Glu Gly Thr Ile Lys Ser Glu Ala Tyr Arg Thr His
 115 120 125
 Ile Lys Arg Ile Asn Pro His Val Glu Val His Gly Val Ala Cys Pro
 130 135 140
 Gly Phe Val Pro Leu Val Glu Gln Met Arg Tyr Ser Asp Pro Thr Ile
 145 150 155 160
 Thr Ser Ile Val Ile His Gln Thr Leu Lys Arg Trp Arg Asn Ser Glu
 165 170 175
 Ser Asp Thr Val Ile Leu Gly Cys Thr His Tyr Pro Leu Leu Tyr Lys
 180 185 190
 Pro Ile Tyr Asp Tyr Phe Gly Gly Lys Lys Thr Val Ile Ser Ser Gly
 195 200 205
 Leu Glu Thr Ala Arg Glu Val Ser Ala Leu Leu Thr Phe Ser Asn Glu
 210 215 220
 His Ala Ser Tyr Thr Glu His Pro Asp His Arg Phe Phe Ala Thr Gly
 225 230 235 240
 Asp Thr Thr His Ile Thr Asn Ile Ile Lys Glu Trp Leu Asn Leu Ser
 245 250 255

Val Asn Val Glu Arg Ile Ser Val Asn Asp
260 265

<210> 47
<211> 822
<212> DNA
<213> E. faecium

<400> 47
atgatac gat tgacagataa tcgccctatc ggattttattg attcaggtgt cggcggcttg 60
actgtagtaa aagaagccct gaaacaatta ccgaatgaaa atattttatt tgtaggagac 120
acagcacgct gcccatatgg ccctagaccc gcggaacagg taatccagta tacttgggaa 180
atgacggatt atctgggtgga gcaaggaatc aagatgctgg tgatcgctg caataccgca 240
actgcgggtg ctttagaaga aatcaaagct gctctttcta ttccagtcac cgggtgtgatc 300
cttcccggta ctagagcggc agtaaaaaaa acacaaaata aacaagttgg cattatcggc 360
acgattggta cggtaaaaaa tcaagcttat gaaaaagcac tgaaagagaa agtaccagaa 420
ttgactgtga caagtcttgc ttgtccaaa tttgtttcag ttgtcgaaa taatgaatac 480
cattcatcgg tggcgaaaaa aattgtggca gaaacattag ctcctttaac cactaaaaaa 540
atcgatacat tgattttggg atgcacccat tatccattat tacgccccat cattcaaaat 600
gtaatgggag aaaatgttca actgatcgat tctggagcag aaacagtagg tgaagtatct 660
atgctgttag attatttcaa tctgagcaat tcaccgcaaa atggctcgac attatgccag 720
ttttatacaa ctggctctgc caaacttttc gaggaatatg ctgaagactg gcttggaatc 780
ggacacttaa atgtagaaca tatcgaattg ggaggaaaat aa 822

<210> 48
<211> 273
<212> PRT
<213> E. faecium

<400> 48
Met Ile Arg Leu Thr Asp Asn Arg Pro Ile Gly Phe Ile Asp Ser Gly
1 5 10 15
Val Gly Gly Leu Thr Val Val Lys Glu Ala Leu Lys Gln Leu Pro Asn
20 25 30
Glu Asn Ile Leu Phe Val Gly Asp Thr Ala Arg Cys Pro Tyr Gly Pro
35 40 45
Arg Pro Ala Glu Gln Val Ile Gln Tyr Thr Trp Glu Met Thr Asp Tyr
50 55 60
Leu Val Glu Gln Gly Ile Lys Met Leu Val Ile Ala Cys Asn Thr Ala
65 70 75 80
Thr Ala Val Ala Leu Glu Glu Ile Lys Ala Ala Leu Ser Ile Pro Val
85 90 95
Ile Gly Val Ile Leu Pro Gly Thr Arg Ala Ala Val Lys Lys Thr Gln
100 105 110
Asn Lys Gln Val Gly Ile Ile Gly Thr Ile Gly Thr Val Lys Ser Gln
115 120 125
Ala Tyr Glu Lys Ala Leu Lys Glu Lys Val Pro Glu Leu Thr Val Thr
130 135 140
Ser Leu Ala Cys Pro Lys Phe Val Ser Val Val Glu Ser Asn Glu Tyr
145 150 155 160
His Ser Ser Val Ala Lys Lys Ile Val Ala Glu Thr Leu Ala Pro Leu
165 170 175
Thr Thr Lys Lys Ile Asp Thr Leu Ile Leu Gly Cys Thr His Tyr Pro
180 185 190
Leu Leu Arg Pro Ile Ile Gln Asn Val Met Gly Glu Asn Val Gln Leu
195 200 205
Ile Asp Ser Gly Ala Glu Thr Val Gly Glu Val Ser Met Leu Leu Asp
210 215 220

Tyr Phe Asn Leu Ser Asn Ser Pro Gln Asn Gly Arg Thr Leu Cys Gln
 225 230 235 240
 Phe Tyr Thr Thr Gly Ser Ala Lys Leu Phe Glu Glu Ile Ala Glu Asp
 245 250 255
 Trp Leu Gly Ile Gly His Leu Asn Val Glu His Ile Glu Leu Gly Gly
 260 265 270
 Lys

<210> 49
 <211> 335
 <212> DNA
 <213> E. saccharolyticus

<400> 49
 gcatgtaata ccgcaacggc ggtagcggtta gaagaaatta aagcgcaatt agatattcca 60
 gtcgtcgggtg tgatcttacc tggtagctcgt gctgcagttta aagctacgaa aaatcgtcaa 120
 atcgggtatta taggaacagc ggggtacaatt aaaagtagtt cgtatgagca agcaattaaa 180
 atgaaagtgc ctgaagcatc ggtgactagt ttagcttgctc cttaaatttgt accgattggt 240
 gaaagtaatc aatttcaatc atcggtagct aaaaaaattg ttgctgagac gttattacca 300
 ttgcaacata aaaaattaga tacgttgatt ttagg 335

<210> 50
 <211> 111
 <212> PRT
 <213> E. saccharolyticus

<400> 50
 Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys Ala Gln
 1 5 10 15
 Leu Asp Ile Pro Val Val Gly Val Ile Leu Pro Gly Thr Arg Ala Ala
 20 25 30
 Val Lys Ala Thr Lys Asn Arg Gln Ile Gly Ile Ile Gly Thr Ala Gly
 35 40 45
 Thr Ile Lys Ser Ser Ser Tyr Glu Gln Ala Ile Lys Met Lys Val Pro
 50 55 60
 Glu Ala Ser Val Thr Ser Leu Ala Cys Pro Lys Phe Val Pro Ile Val
 65 70 75 80
 Glu Ser Asn Gln Phe Gln Ser Ser Val Ala Lys Lys Ile Val Ala Glu
 85 90 95
 Thr Leu Leu Pro Leu Gln His Lys Lys Leu Asp Thr Leu Ile Leu
 100 105 110

<210> 51
 <211> 344
 <212> DNA
 <213> E mundtii

<400> 51
 gtaatcgcat gtaataccgc aactgcggtc gcattagaag aaatcaaagc aacactctcg 60
 attccagtga tcggtgtgat tttgccagga acgagagcgg cagtcaagca gacgaaaaat 120
 catcgagtag ggggtgattgg aacaattggg accgtcaaaa gtgctgctta cgagacggca 180
 ttattggata aagcaccgga actgaaagtt accagcttgg cgtgtccaaa gtttgtttca 240
 gtcgtagaaa gtaaagaata ccgatcatca gtcgctaaaa aaatcgtggc tcaaactttg 300
 cttccattag aattaaaagg gatcgatagc ttgattttag gttg 344

<210> 52

<211> 113
 <212> PRT
 <213> E. mundtii

<400> 52
 Val Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys
 1 5 10 15
 Ala Thr Leu Ser Ile Pro Val Ile Gly Val Ile Leu Pro Gly Thr Arg
 20 25 30
 Ala Ala Val Lys Gln Thr Lys Asn His Arg Val Gly Val Ile Gly Thr
 35 40 45
 Ile Gly Thr Val Lys Ser Ala Ala Tyr Glu Thr Ala Leu Leu Asp Lys
 50 55 60
 Ala Pro Glu Leu Lys Val Thr Ser Leu Ala Cys Pro Lys Phe Val Ser
 65 70 75 80
 Val Val Glu Ser Lys Glu Tyr Arg Ser Ser Val Ala Lys Lys Ile Val
 85 90 95
 Ala Gln Thr Leu Leu Pro Leu Glu Leu Lys Gly Ile Asp Thr Leu Ile
 100 105 110
 Leu

<210> 53
 <211> 340
 <212> DNA
 <213> E. casseliflavus

<400> 53
 atcgcatgta ataccgcgac agcgggtcgcc cttgaagaaa tcaaagaaca actaacgatac 60
 ccagtgatcg gcgtgatcct gcctggcagt cgagcagcag tcaaagcaag caaaaaccaa 120
 cgaatcggtg tcatcgggac aaacggaacg atcaaaagtg actcttataa gcgcgcgctt 180
 catggcaaaag cgcccatgc gtccgctcgtc agtttggtt gcccgaaagt tgtgccgatac 240
 gtagaaagca aacaatacca tagctcggtc gccaaagaaa tcgtggcaga aacgttgcgt 300
 ccattgaaaa acaaacggct agatacgttg attttaggtg 340

<210> 54
 <211> 112
 <212> PRT
 <213> E. casseliflavus

<400> 54
 Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys Glu
 1 5 10 15
 Gln Leu Thr Ile Pro Val Ile Gly Val Ile Leu Pro Gly Ser Arg Ala
 20 25 30
 Ala Val Lys Ala Ser Lys Asn Gln Arg Ile Gly Val Ile Gly Thr Asn
 35 40 45
 Gly Thr Ile Lys Ser Asp Ser Tyr Lys Arg Ala Leu His Gly Lys Ala
 50 55 60
 Pro His Ala Ser Val Val Ser Leu Ala Cys Pro Lys Phe Val Pro Ile
 65 70 75 80
 Val Glu Ser Lys Gln Tyr His Ser Ser Val Ala Lys Lys Ile Val Ala
 85 90 95
 Glu Thr Leu Arg Pro Leu Lys Asn Lys Arg Leu Asp Thr Leu Ile Leu
 100 105 110

<210> 55

<211> 337
 <212> DNA
 <213> E. flavescens

<400> 55
 atcgcatgta ataccgcgac agcgggtcgcc cttgaagaaa tcaaagaaca actaacgatac 60
 ccagtgatcg gcgtgatacct gcctggcagt cgagcagcag tcaaagcaag caaaaaccaa 120
 cgaatcgggtg tcatcgggac aaacggaacg atcaaaagtg actcttataa gcgcgcgctt 180
 catggcaaag cgcccatgc gtccgtcgtc agtttggtt gccgaagt tgtgccgatac 240
 gtagaaagca aacaatacca tagctcggtc gccaaagaaa tcgtggcaga aacgttgcgt 300
 ccattgaaaa acaaacggct agatacgtt attttag 337

<210> 56
 <211> 112
 <212> PRT
 <213> E. flavescens

<400> 56
 Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys Glu
 1 5 10 15
 Gln Leu Thr Ile Pro Val Ile Gly Val Ile Leu Pro Gly Ser Arg Ala
 20 25 30
 Ala Val Lys Ala Ser Lys Asn Gln Arg Ile Gly Val Ile Gly Thr Asn
 35 40 45
 Gly Thr Ile Lys Ser Asp Ser Tyr Lys Arg Ala Leu His Gly Lys Ala
 50 55 60
 Pro His Ala Ser Val Val Ser Leu Ala Cys Pro Lys Phe Val Pro Ile
 65 70 75 80
 Val Glu Ser Lys Gln Tyr His Ser Ser Val Ala Lys Lys Ile Val Ala
 85 90 95
 Glu Thr Leu Arg Pro Leu Lys Asn Lys Arg Leu Asp Thr Leu Ile Leu
 100 105 110

<210> 57
 <211> 341
 <212> DNA
 <213> E. cecorum

<400> 57
 atcgcatgta ataccgcgac tgcagcagct ttaacccaaa ttaaggaaca attagacatt 60
 ccagttgtcg gtgtgatttt acctggaact agagctgctg tcaaaaatac aaaatcgcaa 120
 cgaattggga ttatcggcac acaaggaacc atccaaagtg gcagttatga acaagccatt 180
 ctttctaaag taccgactgc tcaacctgtg agtttagcgt gtcctagatt tgttccgata 240
 gtagaaagta atcaagcaaa ttcaagtgtg gcaaaaaaaa ttgtcgctca aacactacaa 300
 ccgatgacga aaaaaaacat cgatacgtt attttaggtt g 341

<210> 58
 <211> 112
 <212> PRT
 <213> E. cecorum

<400> 58
 Ile Ala Cys Asn Thr Ala Thr Ala Ala Leu Thr Gln Ile Lys Glu
 1 5 10 15
 Gln Leu Asp Ile Pro Val Val Gly Val Ile Leu Pro Gly Thr Arg Ala
 20 25 30
 Ala Val Lys Asn Thr Lys Ser Gln Arg Ile Gly Ile Ile Gly Thr Gln
 35 40 45

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Thr | Ile | Gln | Ser | Gly | Ser | Tyr | Glu | Gln | Ala | Ile | Leu | Ser | Lys | Val |
| 50 | | | | | 55 | | | | | 60 | | | | | |
| Pro | Thr | Ala | Gln | Pro | Val | Ser | Leu | Ala | Cys | Pro | Arg | Phe | Val | Pro | Ile |
| 65 | | | | 70 | | | | | 75 | | | | | 80 | |
| Val | Glu | Ser | Asn | Gln | Ala | Asn | Ser | Ser | Val | Ala | Lys | Lys | Ile | Val | Ala |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Gln | Thr | Leu | Gln | Pro | Met | Thr | Lys | Lys | Asn | Ile | Asp | Thr | Leu | Ile | Leu |
| | | 100 | | | | | | 105 | | | | | 110 | | |

<210> 59
 <211> 339
 <212> DNA
 <213> E. raffinosus

<400> 59
 atcgcatgta ataccgcgac ggcagtagct ttggaagaaa ttaaaagaac cgtagatatt 60
 cccgtaatcg gtgttatata gccaggatct cgcgcagcgt taaaggcaag cgaaaatggg 120
 cgcgtgggaa ttatcggaac cattggaaca gtaaaaagtg gttcttataa acacgaacta 180
 caggaaaaag ctcttgatac ttatgtttct agtttagcat gcccaaaatt tgtaccgatt 240
 gttgaaagta atcaatttaa tagctcggtg gcgaaaaaaa ttgtttctca aacattaact 300
 cctttgaaaa aggaaaagtt ggatacgttg attttaggt 339

<210> 60
 <211> 112
 <212> PRT
 <213> E. raffinosus

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Ala | Cys | Asn | Thr | Ala | Thr | Ala | Val | Ala | Leu | Glu | Glu | Ile | Lys | Arg |
| 1 | | | 5 | | | | | 10 | | | | | 15 | | |
| Thr | Val | Asp | Ile | Pro | Val | Ile | Gly | Val | Ile | Gln | Pro | Gly | Ser | Arg | Ala |
| | | 20 | | | | 25 | | | | | 30 | | | | |
| Ala | Leu | Lys | Ala | Ser | Glu | Asn | Gly | Arg | Val | Gly | Ile | Ile | Gly | Thr | Ile |
| | 35 | | | | | 40 | | | | 45 | | | | | |
| Gly | Thr | Val | Lys | Ser | Gly | Ser | Tyr | Lys | His | Glu | Leu | Gln | Glu | Lys | Ala |
| 50 | | | | 55 | | | | 60 | | | | | | | |
| Pro | Asp | Thr | Tyr | Val | Ser | Ser | Leu | Ala | Cys | Pro | Lys | Phe | Val | Pro | Ile |
| 65 | | | | 70 | | | | 75 | | | | | | 80 | |
| Val | Glu | Ser | Asn | Gln | Phe | Asn | Ser | Ser | Val | Ala | Lys | Lys | Ile | Val | Ser |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Gln | Thr | Leu | Thr | Pro | Leu | Lys | Lys | Glu | Lys | Leu | Asp | Thr | Leu | Ile | Leu |
| | | 100 | | | | | | 105 | | | | | 110 | | |

<210> 61
 <211> 341
 <212> DNA
 <213> E. malodoratus

<400> 61
 atcgcatgta ataccgcaac cgcagtggct ttagaagaga ttaagaagaa cgttgatatt 60
 cctgttattg gtgttatcca accaggatca cgtgctgcat taaaagcaag taaaaatagt 120
 cgtgtaggta tcatcggaac actaggaact gttaaaagtg gatcttataa acatgagctg 180
 caagaaaaag caccagaaac gtatgttgct agtctggcct gcccaaaatt tgtgccaatc 240
 gttgaaagta atcagtttaa tagttctgta gccaaaaaga ttgtttcaca atctctggca 300
 cccttaaaaa aggaaaaatt agatacgttg attttaggtt g 341

<210> 62

<211> 112
 <212> PRT
 <213> E. malodoratus

<400> 62
 Ile Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys Lys
 1 5 10 15
 Asn Val Asp Ile Pro Val Ile Gly Val Ile Gln Pro Gly Ser Arg Ala
 20 25 30
 Ala Leu Lys Ala Ser Lys Asn Ser Arg Val Gly Ile Ile Gly Thr Leu
 35 40 45
 Gly Thr Val Lys Ser Gly Ser Tyr Lys His Glu Leu Gln Glu Lys Ala
 50 55 60
 Pro Glu Thr Tyr Val Ala Ser Leu Ala Cys Pro Lys Phe Val Pro Ile
 65 70 75 80
 Val Glu Ser Asn Gln Phe Asn Ser Ser Val Ala Lys Lys Ile Val Ser
 85 90 95
 Gln Ser Leu Ala Pro Leu Lys Lys Glu Lys Leu Asp Thr Leu Ile Leu
 100 105 110

<210> 63
 <211> 338
 <212> DNA
 <213> E. solitarus

<400> 63
 gcatgtaata ccgcaacagc tgtggcttta gatgagatta aagagcaact gcaaattccct 60
 gttgtgggag ttattatgcc gggaaccaga gcagctgtta aagcgactaa aaatcatcgt 120
 attggtgtga ttggcacaaa aggaacagtt aaaagtgcct cttacaaaacg agcaatcaaa 180
 gaaaaaaatg aaaatacaaaa agtaacaagt ttggcttgtc cgaagtttgt tcccattgtg 240
 gaaagtaatc aaattcattc ttcagtggca aaaaaaattg tatttgaaac actattaccc 300
 ttaaaaaata aacatttaga tacgttgatt ttaggttg 338

<210> 64
 <211> 111
 <212> PRT
 <213> E. solitarus

<400> 64
 Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Asp Glu Ile Lys Glu Gln
 1 5 10 15
 Leu Gln Ile Pro Val Val Gly Val Ile Met Pro Gly Thr Arg Ala Ala
 20 25 30
 Val Lys Ala Thr Lys Asn His Arg Ile Gly Val Ile Gly Thr Lys Gly
 35 40 45
 Thr Val Lys Ser Ala Ser Tyr Lys Arg Ala Ile Lys Glu Lys Asn Glu
 50 55 60
 Asn Thr Lys Val Thr Ser Leu Ala Cys Pro Lys Phe Val Pro Ile Val
 65 70 75 80
 Glu Ser Asn Gln Ile His Ser Ser Val Ala Lys Lys Ile Val Phe Glu
 85 90 95
 Thr Leu Leu Pro Leu Lys Asn Lys His Leu Asp Thr Leu Ile Leu
 100 105 110

<210> 65
 <211> 341
 <212> DNA

<213> E. hirae

<400> 65
 atcgcatgta ataccgctac tgcggttgct ttagaagaaa tcaaggcggc acttcctatt 60
 ccagtcattg gtgtgatctt acctgggaca agagcagctg ttaaacaac aagaaataaa 120
 caagtaggga ttatcggaac cctcggaacg atcaaaagtc gtgcttatga aacagcgctg 180
 aaaacgaagg tacctgaact tgccgtgact agtttggtt gtccaaaatt cgtttcggta 240
 gtggaaagta atgaatatca ttcgtcagtg gcaaaaaaaa tcgttgccca gacactagcg 300
 ccattgggta ctaagaaaat cgatacgttg attttaggtt g 341

<210> 66
 <211> 111
 <212> PRT
 <213> E. hirae

<400> 66
 Ala Cys Asn Thr Ala Thr Ala Val Ala Leu Glu Glu Ile Lys Ala Ala
 1 5 10 15
 Leu Pro Ile Pro Val Ile Gly Val Ile Leu Pro Gly Thr Arg Ala Ala
 20 25 30
 Val Lys Gln Thr Arg Asn Lys Gln Val Gly Ile Ile Gly Thr Leu Gly
 35 40 45
 Thr Ile Lys Ser Arg Ala Tyr Glu Thr Ala Leu Lys Thr Lys Val Pro
 50 55 60
 Glu Leu Ala Val Thr Ser Leu Ala Cys Pro Lys Phe Val Ser Val Val
 65 70 75 80
 Glu Ser Asn Glu Tyr His Ser Ser Val Ala Lys Lys Ile Val Ala Gln
 85 90 95
 Thr Leu Ala Pro Leu Val Thr Lys Lys Ile Asp Thr Leu Ile Leu
 100 105 110

<210> 67
 <211> 29
 <212> DNA
 <213> Homo sapiens

<400> 67
 aaatagtcac atgaaaatag gcgttttttg 29

<210> 68
 <211> 28
 <212> DNA
 <213> Homo sapiens

<400> 68
 agaattctat tacaatttga gccattct 28

<210> 69
 <211> 26
 <212> DNA
 <213> Homo sapiens

<400> 69
 gcgaattcga tcagaatttt ttttct 26

<210> 70
 <211> 26
 <212> DNA

<213> Homo sapiens

<400> 70
ataagtactt gtgaatctta tactag 26

<210> 71
<211> 29
<212> DNA
<213> Homo sapiens

<400> 71
aaaatgctag taatcgcatg taataccgc 29

<210> 72
<211> 26
<212> DNA
<213> Homo sapiens

<400> 72
tgggtacaac ctaaaatcaa cgtatc 26

<210> 73
<211> 765
<212> DNA
<213> Aquifex pyrophilus NA sequence

<400> 73
atgaagatag gtatctttga cagtgggtgtg gggggactta ctgttctaaa ggctataaga 60
aatagatata gaaagggtta tatagtatac ctcggtgata ccgcaagggt tccctacggc 120
ataaggtcta aagatacgat aatcagatac tcccttgagt gtgcgggctt tttaaaggat 180
aagggtgttg atataatcgt cgttgcctgc aataccgcaa gtgcttacgc tcttgaacgt 240
ttaaagaaag agataaacgt tcccgttttc ggcgttattg aaccgggggt taaagaagcc 300
ttaaaaaagt caaggaataa aaaaatagga gttataggaa ctccctgcaac cgtaaaaagc 360
ggagcctacc agagaaagct tgaagagggg ggagctgatg tttttgcaaa ggccctgtccc 420
ctattcgttc cccttgcgga ggaagggtctc cttgaggggg agataacaag aaagggttgta 480
gaacactacc ttaaggagtt taaaggtaag attgatactc tgatttttagg atgtacccat 540
taccctcttc ttaaaaagga gataaagaag tttttgggag acgttgaagt cgttgactct 600
tccgaagccc tttccctttc cctccataac tttataaagg acgatgggtc ctcacccctt 660
gagttatttt ttacggacct ttccccaat ctccagtttt tgattaaatt aatactcggg 720
agggattacc cggtaaaact tgcggagggg gtttttacac attaa 765

<210> 74
<211> 262
<212> PRT
<213> Aquifex pyrophilus amino acid sequence

<400> 74
Met Lys Ile Gly Ile Phe Asp Ser Gly Val Gly Gly Leu Thr Val Leu
1 5 10 15
Lys Ala Ile Arg Asn Arg Tyr Arg Lys Val Asp Ile Val Tyr Leu Gly
20 25 30
Asp Thr Ala Arg Val Pro Tyr Gly Ile Arg Ser Lys Asp Phe Thr Thr
35 40 45
Ile Ile Arg Tyr Ser Leu Glu Cys Ala Gly Phe Leu Lys Asp Lys Gly
50 55 60
Val Asp Ile Ile Val Val Ala Cys Asn Thr Ala Ser Ala Tyr Ala Leu
65 70 75 80
Glu Arg Leu Lys Lys Glu Ile Asn Val Pro Val Phe Gly Val Ile Glu
85 90 95

Pro Gly Val Lys Glu Ala Leu Lys Lys Ser Phe Thr Arg Asn Lys Lys
 100 105 110
 Ile Gly Val Ile Gly Thr Pro Ala Thr Val Lys Ser Gly Ala Tyr Gln
 115 120 125
 Arg Lys Leu Glu Glu Gly Gly Ala Asp Val Phe Ala Lys Ala Cys Pro
 130 135 140
 Leu Phe Val Pro Leu Ala Glu Glu Gly Leu Leu Glu Gly Glu Ile Thr
 145 150 155 160
 Arg Lys Val Val Glu His Tyr Phe Thr Leu Lys Glu Phe Lys Gly Lys
 165 170 175
 Ile Asp Thr Leu Ile Leu Gly Cys Thr His Tyr Pro Leu Leu Lys Lys
 180 185 190
 Glu Ile Lys Lys Phe Leu Gly Asp Val Glu Val Val Asp Ser Ser Glu
 195 200 205
 Ala Leu Ser Leu Ser Leu His Asn Phe Ile Lys Asp Asp Gly Ser Ser
 210 215 220
 Ser Leu Glu Leu Phe Thr Phe Phe Thr Asp Leu Ser Pro Asn Leu Gln
 225 230 235 240
 Phe Leu Ile Lys Leu Ile Leu Gly Arg Asp Tyr Pro Val Lys Leu Ala
 245 250 255
 Glu Gly Val Phe Thr His
 260

<210> 75
 <211> 19
 <212> DNA
 <213> Homo sapiens

<400> 75
 tgatgcaaca aatggacga

19

<210> 76
 <211> 18
 <212> DNA
 <213> Homo sapiens

<400> 76
 ttacaatttg agccattc

18